DEVELOPING SCIENCE TEACHING TEXTBOOK BASED ON CONSTRUCTIVISM METHOD AND OUTDOOR LEARNING MODELS ON THE TOPIC OF *STRUCTURE AND FUNCTION OF PLANTS* TO IMPROVE STUDENTS ACHIEVEMENT AT ELEMENTARY SCHOOL TUREN 02 MALANG

THESIS

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FACULTY OF TARBIYAH AND TEACHING SCIENCES
STATE ISLAMIC UNIVERSITY MAULANA MALIK IBRAHIM MALANG

Juli, 2014

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THESIS

Presented to faculty of Tarbiyah and Teaching Sciences, State Islamic University Maulana Malik Ibrahim of Malang in partial fulfillment of the requirement for the degree of Sarjana Pendidikan Islam (S.Pd)

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DEVELOPING SCIENCE TEACHING TEXTBOOK BASED ON CONTRUCTIVISM METHOD AND OUTDOOR LEARNING MODELS ON THE TOPIC OF *STRUCTURE AND FUNCTION OF PLANTS* TO IMPROVE FOURTH GRADE STUDENTS ACHIEVEMENT AT ELEMENTARY SCHOOL TUREN 02 MALANG

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MOTTO

﴿١٣٩﴾ مُّؤۡمِنِينَ كُنتُمۡ إِن ٱلۡأَعۡلَوۡنَ وَأَنتُمُ تَحۡزَنُواْ وَلَا تَهِنُواْ وَلَا

"Janganlah kamu bersikap lemah, dan janganlah (pula) kamu bersedih hati, Padahal kamulah orang-orang yang paling Tinggi (derajatnya), jika kamu orang-orang yang beriman."

(Surat Ali imron ayat 139)

Kesuksesan Dilahirkan Dari 99% Kegagalan Yang Dipahami Dengan Sikap Anti Menyerah

(James Dyson: Quantum Sabar)

Mokhammad Yahya, MA.,Ph.D
The Lecture of Tarbiyah and Teaching Sciences Faculty
The State Islamic University of Maulana Malik Ibrahim Malang

ADVISOR OFFICIAL NOTE

Matter : Latifatus Sholikha Malang, 5 Juli 2014
Appendix : 4 (four) Exemplars

Dear,
Dean of Tarbiyah and Teaching Sciences Faculty
The State Islamic University of Maulana Malik Ibrahim Malang
At Malang

Assalamu'alaikum. Wr. Wb.

After Carrying out at several times for guidance, both in terms of content, language and writing technique, and after reading the following thesis:

Name : Latifatus Sholikha
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Program : Teacher Education Islamic Elementary School
Title of Thesis : Developing Science Teaching Textbook Based on Constructivism Method and Outdoor Learning Model on The Topic of Structure and Function of Plants To Improve Fourth Grade Students Achievement at Elementary School Turen 02 Malang.

As the advisor, we argue that this thesis has been proposal and tested decent.

Wassalaamu'alaikum. Wr. Wb

Advisor,

Mokhammad Yahya,MA., Ph.D
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DEDICATION SHEET

لْعَٰلَمِينَ رَبِّ لِلَّهِ ٱلْحَمْد

Praise be to Allah almighty, my simle imaginers of kinds of the words in my brains has visualized to appeer his values. All of them have been beautifully in this simple white paper.

This simple white paper is dedicate to:

My beloved parents Mr. Basori and Mrs. Mukaromah, as well as my brother Ahmad Fahrur Rozi along with my cat Popong and Piping, and to Tedy Firman Agus Fidiantoro.

Nothing ever ceasing to love me sincerely, that always helps both moral, material and prayer, so i was able to look at and facing the future brighter.

All teacher and Lecturers, which gives a motivations the form of knowledge and a blessed that i can determine the direction and purpose of life according to the Syar'I

And my Friendship, Agustin Islamiyah, and all my friends especially in Internasional Class Program

which I can not mention one by one, I say thank you very much for all the help and support

STATEMENT LETTER

I cartify that the thesis i wrote to fullfill the requirement for Sarjana Pendidikan Islam (S.Pd.I) entilted Developing Science Teaching Materials Based On Contructivism Method on Structure And Function of Plants And Outdoor Learning Models To Improve 4th grade students achievement and understanding in elementary school turen 02 is truly my original work. It does not corporate any materials quotations and bibliography. Due to fact, I am the only person who responsible for he thesis if there is any objection or claim from others.

Malang, 2 juli 2014

Latifatus Sholikha

NIM.10140048

PREFACE

بِسْمِ ٱللَّهِ ٱلرَّحْمَٰنِ ٱلرَّحِيمِ

Praise be to Allah The All Merciful and The All Compassionate. Thanks to Allah because of all blessing and guidance, so the writer able to finish the arragement of Research and Development "*Developing Science Teaching Textbook Based On Contructivism Method and Outddor Leraning Models On The Topic Structure and Function Of Plants to Improve Fourth Grade Students Achievement at Elementary School Turen 02 Malang*" as the final instruction activities on Maulana Malik Ibrahim State Islamic University Malang.

Shalawat and Salam uniterruptedly extended to Prophet of Myhammad, and all the families, friens, and all Muslim. There is no pronounceable word that can be extended except the great gratitude to the Excellency:

1. My Parents, Mr. Basori and Mrs. Mukaromah, as parents who are always pray uninterruptedly and encourage the writer.
2. Prof. Dr. H. Mudjia Raharjo, M.Si as the Rector of Maulana Malik Ibrahim State Islamic University of Malang.
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information, gve suggestions, advices, and guidance in the process of observation and write this report.

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10. The Student of 4^{th} of Elementary Schools who actively participate on the process of observation.
11. All the colleagues of ICP PGMI 2010 who always give support and experience of arragement and observation this report

The writer realize about thedefectiveness of this Research and Development report. Therefore, the wroter needs constructed critical and suggestion from all parties and reader to next perfect report arrangemet.

Malang, 2 juli 2014

Researcher

Latifatus Sholikha

NIM.10140048

TRANSLATION GUIDELINES OF ARABIC LATIN

Translation of Arab Latin in this thesis utilize the translation guidelines based on agreement between Religion Minister and Educational and Culture Minister of Indonesia number 158, 1987 and no. 0534 b/U/1987:

A. Hijaiyah Letters

ا	=	A	ز	=	z	ق	=	Q
ب	=	B	س	=	s	ك	=	K
ت	=	T	ش	=	sy	ل	=	L
ث	=	Ts	ص	=	sh	م	=	M
ج	=	J	ض	=	dl	ن	=	N
ح	=	H	ط	=	th	و	=	W
خ	=	Kh	ظ	=	zh	ه	=	H
د	=	D	ع	=	‘	ء	=	,
ذ	=	Dz	غ	=	gh	ي	=	Y
ر	=	R	ف	=	f			

B. Long Vocal

Vocal (a) long = â

Vocal (i) long = î

Vocal (u) long = û

C. Vocal Difthong

أوْ	=	Aw
أيْ	=	Ay
أوْ	=	Û
إيْ	=	Î

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ABSTRAK

Sholikha, Latifatus. 2014. *Pengembangan Bahan Ajar IPA Berbasis Konstruktivisme Dengan Model Outdoor Learning Untuk Meningkatkan Prestasi Dan Pemahaman Siswa Kelas IV Materi Struktur dan Fungsi Bagian Tumbuhan.* Skripsi. Jurusan Pendidikan Guru Madrasah Ibtidaiyah. Fakultas Ilmu Tarbiyah dan Keguruan. Universitas Islam Negeri Maulana Malik Ibrahim. Pembimbing, Mokhammad Yahya, MA., Ph. D.

Kata Kunci : IPA, Pengembangan, Buku Ajar, Outdoor Learning.

Ilmu Pengetahuan Alam (IPA) berhubungan dengan cara mencari tahu tentang alam secara sistematis, sehingga IPA bukan hanya penguasaan kumpulan pengetahuan yang berupa fakta-fakta, konsep-konsep, atau prinsip-prinsip saja tetapi juga merupakan suatu proses penemuan. Proses pembelajarannya menekankan pada pemberian pengalaman secara langsung untuk mengembangkan kompetensi agar menjelajahi dan memahami alam sekitar secara alamiah.

Untuk mewujudkan pembelajaran tersebut, maka diperlukan suatu pengembangan buku ajar berbasis *konstruktivimse* dan *outdoor learning model* yang mampu meningkatkan prestasi siswa khususnya pada mata pelajaran IPA pada materi struktur dan fungsi bagian tumbuhan.

Penelitian ini dilaksanakan di SDN Turen 02 dengan objek penelitian siswa kelas IV yang berjumlah 28 anak. Adapun tujuan dilakukanya peelitian ini adalah; menghasilkan produk yang berbentuk buku bahan ajar dengan menggunakan konstruktisme dan juga di gunakan di luar kelas dengan mengadakan penelitian di sekitar sekolah; manfaat dan fungsi, standar kompetensi, kompetensi dasar, indikator, prosedur dan penggunaan buku; dan juga gambar gambar yang disertai. Semua telah tervalidasi untuk meningkatkan prestasi dan juga pemahaman siswa pada mata pelajaran IPA kelas IV SDN Turen 02 Malang.

Penelitian ini menggunakan jenis penelitian pengembangan *Research and Development (R&D),* dengan model *Walter Dick and Lou Carey*. Hasil penelitian pengembangan ini berupa buku ajar IPA dalam materi struktur dan fungsi bagian tumbuhan. Penelitian ini dilaksanakan di SDN Turen 02 dengan jumlah siswa 28 anak.

Berdasarkan hasil validasi didapatkan bahwa buku panduan praktikum mendapat penilaian kualifikasi yang baik, karena berdasarkan hasil validasi diperoleh nilai dari guru mata pelajaran sebesar 92 % yang berarti buku panduan praktikum sangat layak dan tidak perlu revisi, dari uji coba lapangan buku panduan praktikum mendapat kualifikasi layak dari semua subyek validasi uji coba lapangan. Dari ahli isi mendapat nilai 90 % dan berada pada kualifikasi layak sehingga tidak perlu revisi, sedangkan dari ahli desain buku ajar buku panduan praktikum mendapat nilai 95 % dan berada pada kualifikasi layak, sehingga buku tidak perlu revisi. Sedangkan hasil penyajian nilai *pre-test* dan *post-test* dilakukan dengan menggunakan mean (rerata). Diperoleh mean *pre-test* menunjukkan hasil 66,42 lebih kecil dibandingkan hasil *post-test* sebesar 85,7

hasil analisis tersebut menunjukkan bahwa terdapat peningkatan. Selain itu untuk memperkuat hasil peningkatan pemahaman siswa dilakukan dengan analisis t-test yang menunjuka T_{hitung}=4, 641 lebih besar dat T_{tabel}=1,071, maka disimpulkan H_0 ditolak dan H_a diterima, sehingga terdapat perbedaan yang signifikan antara hasil pemahaman sebelum dan sesudah menggunakan buku ajar hasil pengembangan, maka dapat disimpulkan buku ajar IPA tebukti secra signifikan efektif meningkatkan pemahaman siswa kelas IV pada mata pelajaran IPA khusunya materi struktur dan fungsi bagian tumbuhan.

ABSTRACT

Sholikha, Latifatus. 2014. *Developing Science Teaching Materials Based on Contructivism Method on Structure and Function of Plants and Outdoor Learning Models To Improved 4th grade Students Ahcievement and Understanding in Elementary School Turen 02.* Thesis. Islamic Elementary School Teacher Education Program, Tarbiyah and Teaching Science Faculty, State Islamic University Maulana Malik Ibrahim Malang, Advisor: MokhammadYahya, MA., Ph. D.

Key Word*: Natural Science, Development, Outdoor Learning.*

Natural Sciences (IPA) is associated with the natural way of finding out about a systematic way, so that not only the mastery of science knowledge in the form of a collection of facts, concepts, or principles, but also a process of discovery. The learning process emphasizes providing direct experiences to develop competencies in order to explore and understand the universe around naturally.

To realize this learning, then needed a textbook development based on contructivsm and outdoor learning model to improve student achievement, especially in science subjects in the material structure and function of plant.

This research was conducted at SDN 02 with the object of research Turen fourth graders who totaled 28 children. The purpose of this is dilakukanya peelitian; produce teaching materials in the form of a book using Consructivism and also in use outside the classroom to conduct research around the school; benefits and functions, standards of competence, basic competence, indicators, procedures and use of books; and also the accompanied image. All have been validated to improve student achievement and understanding of teaching science in the fourth grade at SDN 02 Turen Malang.

This research uses research development Research and Development (R & D), with a model of *Walter Dick and Lou Carey*. The results of a study of this development in material science textbook structure and function of plant parts. This research was conducted in SDN Turen 02 the number of students 28 children.

Based on the validation results showed that manual assessment lab got good qualifications, because the validation of the results obtained by the value of the subject teachers by 92% which means the book is well worth the lab guide and does not need revision, from field trial lab manual got decent qualifications of all subjects validation field trials. Of content experts scored 90% and are at a decent qualification that does not need revision, while the expert design textbook lab manual scored 95% and was in decent qualifications, so that the book does not need to be revised. While the presentation of the results of the value of pre-test and post-test was conducted by using the mean (average). The mean pre-test results showed 66.42 less than the post-test results of 85.7 results of the analysis show that there is an increase. In addition to strengthening the result of an increased understanding of the students is done by t-test analysis to show a t count = 4, 641 greater of data table = 1.071, then the inferred H0 is rejected and Ha accepted, so there are significant differences between the results of understanding before and after use textbooks development results, it can be concluded textbook IPA evident significant effectively improve the understanding of fourth grade students in science subjects especially the material structure and function of plant parts.

الملخص

شوليكا، لاتيفاتوس. 2014. التنمية المستندة إلى علم المواد "البنائية مع نموذج الهواء الطلق التعلم" تحسينالإنجاز والفهم "الصف الرابع مواد" هيكل ووظيفة أجزاء النبات. أطروحة. إيبتيدايية مدرسة المعلمين تخصص التربية. كلية التربية وإعداد المعلمين. أوينين مولانا إبراهيم مالك. ،.دكتوراه المشرف، محمد يحيى، اماه

.الكلمات الرئيسية: العلوم، والتنمية، والكتاب المدرسي، التعلم في الهواء الطلق

التعامل مع كيفية معرفة حول طبيعة بشكل منتظم، حيث أن وكالة تشجيع (IPA) العلوم الطبيعية الاستثمار ليس مجرد التمكن من المعارف في شكل حقائق أو مفاهيم أو مبادئ، لكن هو أيضا في عملية الاكتشاف. دراسة تحليلية عملية تركز على توفير تجربة مباشرة تطوير الكفاءات من أجل .استكشاف وفهم المناطق الطبيعية المحيطة بطبيعة الحال

لتحقيق التعلم، ثم يلزم تطوير الكتب المدرسية، ونموذج التعلم القائم على كونستروكتيفيمسي في الهواء الطلق التي قادرة على زيادة تحصيل الطلاب، وبخاصة في .موضوعات العلوم الطبيعية المادية في هيكل ووظيفة زرع أجزاء

أجرى هذا البحث في شبكة التنمية المستدامة مع كائن البحث 02 تورين الصف الرابع من 28 طفلا. أما بالنسبة للغرض من هذه البحوث المعلقة في ديلاكوكانيا كان، إنتاج منتج في شكل مواد الكتاب باستخدام كونستروكتيسمي، وأيضا في استخدام خارج الفصول الدراسية بإجراء البحوث حول المدرسة، فوائد والدالة والكفاءات الأساسية، ومعايير الكفاءة، والمؤشرات، الإجراءات واستخدام الكتاب، وأيضا الصورة مصحوبة الصورة. تم التحقق من كل شيء تحسين تورين 02 SDN تحصيل الطلاب، وأيضا التفاهم على مواضيع العلوم الطبيعية الصف "الرابع ".مالانغ

، مع نموذج (R & D) هذا البحث استخدام هذا النوع من البحث هو تطوير البحوث والتنمية لبرج والمرارة. تطوير البحث من مدرسي العلوم الطبيعية في بنية مادية والوظيفة لأجزاء النبات. طالبا مع الأطفال 28 02 SDN وأجريت هذه البحوث في تورين

استنادا إلى نتائج التحقق من الصحة يتم الحصول على أن تقييم الدليل العملي يحصل تأهيل جيد، لأنه استنادا إلى نتائج التحقق من صحة القيمة المكتسبة من مدرسي المواد من 92٪ مما يعني الدليل العملي جدير جدا ولا تحتاج إلى مراجعة، ومن التجارب الميدانية الكتاب دليل عملي يحصل على مؤهل لائقة لجميع المواضيع للتحقق من الصحة لحقل تجارب. يحصل على قيمة محتويات نسبة 90٪ وهي في التصفيات لائقة حيث أنها لا تحتاج إلى تنقيح، بينما خبراء التصميم من كتاب العملي كتاب دليل يحصل على قيمة من 95٪، والمؤهلات المناسبة، حيث الكتاب لا تحتاج إلى .(مراجعة. بينما نتائج تمثيل قيمة قبل-وبعد اختبار - اختبار إجراء باستخدام المتوسط (متوسط الحصول على نتائج يعني قبل الاختبار يظهر 66.42 أصغر من الغلة بعد اختبار نتائج تحليل 85، 7 يشير إلى أن هناك زيادة. بالإضافة إلى تعزيز تحسين فهم الطلاب هو الاضطلاع بتحليل اختبار ثم يتم رفض تم استنتاجه H0أن مينونجوكا ثيتونج ر = 4، 641 دات أكبر تابيل = 1.071، وهكتار، حيث أن هناك فرقا كبيرا بين نتائج التفاهم قبل وبعد استخدام النتائج لتطوير الكتب المدرسية، ثم أنه يمكن الاستدلال على كتاب أصد أثبتت فعاليتها لايف إلى حد كبير تحسين الفهم لطلاب الصف "الرابع معهد الإدارة العامة" في الموضوعات المادية لا سيما هيكل ووظيفة أجزاء .النبات

CHAPTER I

INTRODUCTION

In this chapter explained about, (a) research background, (b) problem statement, (c) development objectives, (d) development products, (e) development benefit, (f) definition of terms, (g) and operational definitions.

A. Research Background

Science is one of the cumpolsory subject fof students of Elementary School (SD) or Madrasah Ibtidaiyah (MI). This is because, by studying science students are expected to develop knowledge and understanding of science concepts that are useful and can be applied in everyday life. In addition obtaining knowledge, concepts and skills of science as a basis of continuing education ti SMP/MTs. Rsseau in Abu Ahmadi and Ubhiyati Nur suggested that “Education gives us no inventory at the time of the children, but we need it at maturity. "While Abu Nur Ahmadi and Uhbiyati himself argued that" education is a conscious and deliberate effort as well as adults and are responsible for adult children and continuous”.

The issue of education and learning is a complex issue where many factors that influence it. One of these factors is a teacher, which is the holder of an important and major role, because the success of the teaching and learning process is determined by the teacher. In this case the task of the

teacher is delivering course material to students through interaction of communication in the process of teaching and learning that he did.[1]

In addition to the factors of the teachers is an important factor in the implementation of education is learning materials. With the teacher teaching materials be assisted in implementing a study in class and students will be more helpful and easier to follow the learning process takes place.

Learning methods that set many teachers allow students to learn the process (*learning by process*), not only learn the product (*learning by product*). Learning products are generally only put emphasis on the cognitive aspect. While the learning process can allow the achievement of learning objectives in terms of cognitive, affective (attitude) and psychomotor (skills). Therefore, learning is directed to achieve these goals, which is much more emphasized learning through the process. Gagne and Riggs in this case see the importance of learning process. So important to not attempt to teach the teacher learning materials, but how students can study learning materials in accordance with purpose. The effort teacher is a series of events that may affect student learning. This means the role of the teacher change, from originally as publisher of learning material, into influence and giver of ease for the occurrence of the student's learning process.[2]

Especially in science learning at the elementary school SD / MI should be implemented by involving students in learning activities. In

[1] Asnawi dan M. Basyirudin Usman, *Media Pembelajaran,* (Jakarta: Ciputat Pers, 2002), page.1

[2] Dra Sumiati, , *Metode Pembelajaran*, (Bandung: CV Wacana Prima, 2008), page. 91

learning science is expected to develop some aspects, which one is the cognitive aspects, skills in a learning process, have a scientific, students can have the creativity, and also have the ability to apply science (natural science). A teacher must be have the ability to manage the process of learning science by using a and certain methods so that students can acquire learning that stage of the learning process in a skills includes learning, scientific attitude and mastery of concept in learning materials that will be given to students. The use of appropriate teaching and learning strategies, which are invited to provide an opportunities for students to participate actively in the teaching and learning process is heavily dependent on the purpose and content of the teaching and learning process and teaching activities.[3]

Learning method suitable for Indonesian children learn through direct experience (learning by doing). This method of learning reinforces the memory of children and the cost is very cheap for using tools and media learning in child's environment itself. Children can benefit from the objects that are around to support their learning activities, so that learning science is not only done in the classroom or in the laboratory only, but could be in the environment. Children's memory will be durable if the studets own experience in learning from what he had learned. Especially in science subjects, many opportunities for children to gain experience directly with developing process skills and a range of learning strategies used. Surely the

[3] Nana Sudjana, *Dasar-Dasar Proses Belajar Mengajar,* (Bandung: PT. Remaja Rosda Karya, 1989), page. 76.

teacher should be able to use a strategy by adjusting the text book to be taught to students.

In the learning science at school can be done by applying a method of outdoor learning. With the implementation of this method is expected that students can become more active, creative, and critical in the learning of science. Such methods can be obtained from review of the empirical facts (naturally/natural) moving towards the concept, proportion, or even a theory.

Outdoor learning method is a set of tools for contextual learning is done outside the classroom (utilizing the environmental conditions around the school). This learning puts student learning as subject (not the object) educated who interact directly with objects that were examined in the field (outdoor). This leads to a kind of learning activities, creativity, as well as criticality of the students in the areas of congnitive, affective, and psychomotor).

Outdoor learning patterns learning based on the assumption that learning is a process that can develop imagination thingking of students to a problem that exists around him. Learning is an attempt to create and provoke the meotions of the learners to think and work critical of existing environment in the vicinity. Studying towards the development of a way of thinking and acting in interdisciplinary problem solving, because observing directly againts the facts on the ground.[4]

[4] Alfin Toffler, *Kejutan Masa Depan* (Jakarta: P.T. Pantja Simpati, 1970), page. 170-177

Science learning is very suitable if applied by using the method of outdoor learning because there is a relationship between two. Science as one of the subjects related to the context of the surrounding nature and living things. Therefore, the pattern of learning with a practical approach to outdoor learning needed. Already we know that the outdoor learning is a learning method to learn a pattern or practice on real objects (in the field) performed outside or around the classroom/school.

In the learning process by using this method is need for support from the environment around the school. In this case is the support of the environment around the school have media on the outside and in the classroom that can be used for learning science by using the methods of outdoor learning. Once observed, the environmental conditions in the SDN Turen 02 is suitable if applied method outdoor learning. This school are in the rural areas, which have the wonderful natural environment. Around the school environment there are many children who are covered by a lot of that can be use as a place of learning and science with material structures and parts of plants.

Based on the results of the initial research with teachers of subjects science class 4^{th} grade at Elementary School Turen 02 Malang, found that learning science learning in particular carried out on the material structure and function of plant parts are still a many problem. Among other issues, the interrelations between 1) lack of media support in the learning science especially in material structure and fuction pf plant parts. The availability of

media that exist only as pictures, 2) in the absence of specific practical manual experiments in the material Structure and Function of Plant Parts. The experiment has been available in printed books and worksheets book, but not used to its full potential, 3) the lack of participation of students in the learning process, especially at the time of the science experiment, 4) students in the learning process observation and practicum out of the classroom so that the students understand the material structure and function of plant parts, 5) lack of teaching resource book are still less relevant that used well used by teachers and students. Plus specifically for elementary school children 4th grade who still think the concrete operational stage, should be given the material in according to the environment where the child lived, so that students are not delusional in getting knowledge, 6) teachers are still using the conventional method by using method of lecture and questioning in teaching science so that students become bored.[5] Not only that when i choose the research developing the texbook because one of them in the school book owned only monotonous and uninteresting, used textbooks tend to just load the material and questions about the course and there are no observations, the design of the book also tends not to make the child colorful be lazy to open a book, the design also use tradisionil and can't not change to student achievemnet in the learning. In addition to that there is also no laboratories so that the children never knows the materilas directly. So i develop the textbook natural science based on constructivism by developing so that children learn

[5] Wawancara dengan guru mata pelajaran IPA kelas IV tanggal 20 Juli 2013 pukul 09.45 di SDN Turen 02.

and develop them selves in the lesson by use model outdoor learning to knowing about the material of the textbook on the topic structure and function of plant.

Based on the above background exposure, researchers interested in conducting research and development in materials by taking the title of "Developing Science Textbook Based on Constructivism Method and Outdoor Learnin Model on The Topic of *Structure and Function of Plants* To Improve Fourth Grade Students Achievement at Elementary School Turen 02 Malang ".

B. Problem Statement

Based on the background above, the problem formulations in this study are:

1. How is teh process of preparation of learning textbook and science book class IV with constructivism method and outdoor learning model to improve student achievement?
2. How is the feasibility of constructivism-based science textbook on the topic structure and function of plant for 4^{th} grade student at elementary school Turen 02?
3. How the students achievement of those who use the textbook based on constructivism method and otdoor learning model?

C. Objectives of the Study

Based on above problem formulation, the objectives of this research are :

1. To develop learning material of science textbook with constructivism-method and outdoor learning model to improve student achievement.
2. To describe the feasibility of materials science based constructivism for grade 4th Elementary School Turen 02 Malang.
3. To know the student achievement who have used the textbook science with students who did not use the book learning materials developed.

D. Development Product

Development of products that will be produced in the form of teaching materials to the material structure and function of plant science this 4th grade SD / MI. The Products resulting from the development of teaching material is expected to have the following specifications:

1. Product specification produced in this development is the print media in the form of textbooks *(material printed).*
2. The Material presented is a material structure and function of plant parts in 4th grade Elementary School/MI.
3. The textbook presented in learning equipped with practical work and student activities.
4. Teaching of textbook emphasize the understanding and application in everyday life.

5. Textbook emphasizes on understanding learning through outdoor learning with observations in real environment and not abstract
6. Teaching materials containing between the topics that have been studied or materials have not been studied.
7. The textbook contains questions that lead students to build their own knowledge and understanding of the material presented.
8. Teaching of textbook contains questions that lead students to better himself by constructing their understanding of the material presented.
9. At the end of the chapter there is a summary of the material to facilitate students in understanding the concept of material that has been studied.
10. Textbooks developed, supplemented by an evaluation of the chapter take second-book UASBN year 2011/2012 to test understanding of students

E. Development Benefit

At least from the research will be obtained two benefits, the benefits in terms of theoretical and practical aspects.[6] For more details, will be presented in several matters related to the benefits of this study as follows:

1. Theoritical Benefits

The results of this research can be used as material for advanced studies that are relevant and are used as a reverensi associated with the development of science teaching textbook based on constructivism methods

[6] Ridwan. *Metode dan Tehnik Menyusun Proposal Penelitian* (Bandung: Alfabeta. 2009)

and outdoor learning models. In addition, as a practical step to develop the educational science, especially in the field of PGMI.

2. Practical Benefit

In general, the benefits of this research is to motivate all teachers to be more creative in implementing strategies and media in teaching and learning to solve the problem of learning that directly put into practice in the classroom.[7] The expected benefits for the development of learning materials structure and function of plant parts in particular include:

a. For teacher and researhers

This research, carried out can help teachers in the teaching and learning process, especially for subject IPA in the 4th grade SD / MI, the learning process more effective and efficient as we can understand the theory of the development of the media and how to make learning more applicative.

b. For the students

With the implementation of this research, will help students who have difficulty learning science, because the nature of applicative and fun, students can be actively involved in using media textbook to help more creative thinking and play active role, reducing the saturation in the learning process so that students more relaxed without feeling burdened.

[7] Kasiram. *Metodologi Penelitian*.(Malang: UIN Press. 2008). page,166

c. Institutions (SDN Turen 02 and other educational institutions)

Through the research findings of this study, is expected to obtain input, and the picture of the cognitive information to further develop more innovative teaching materials and creative concepts to help understanding and improve student achievement.

F. Definition of terms

Wahidmurni suggested "Term of definitions is an explanation of concepts or variables existing research in the title of the research".[8] It is intended to give rise to different interpretations of the concept or the rationale in this research. Definition of the term of the study are as follows :

1. Development which in English is called development, processing has meaning phrases and motifs with the detail of the previously theme or expressed.[9] The research focused on the development of learning science textbooks 4th grade based on constructivism method and outdoor learning models on the topic structure and function of plant.
2. The textbook is a school books which contains material that have been selected on the specific field of study, in a written form that meets certain requirements in the teaching and learning activities, arranged systematically to be assimilated."Chambliss dan Calfee (1998) explained in detail. Textbooks is a tool students to understand and learn from the things to read and to understand the world (outside her). Textbooks have

[8] *Ibid* ., page 26

[9] Kommaruddin dn Yooke Tjuparmah S. Komaruddin, *Kamus Istilah Karya Tulis Ilmiah,* (Jakarta: PT. Bumi Aksara, 2000), page.186

unusually large power to change students' brains. Textbooks can affect the child's knowledge and specific values.[10]

3. Natural Sciences (IPA) is the study of the natural surroundings and its contents. This means that the IPA learn all objects in nature, events, and symptoms that appear in nature. Science can be defined as a knowledge that is objective. So in terms of the term IPA is a knowledge that is on the natural surroundings and its contents.[11]
4. The development of learning materials in the form of textbook is the development of a set of systematically arranged material both written and not that create an environment or atmosphere that allows students to learn.
5. Constructivism methods is a view of science learning that is developed with constructivist theory that encourages students to construct knowledge beginning students obtained during the process of students learnig to create a new knowledge in accordance with the concept pf force.
6. Outdoor learning models is a set of tools contextual learning is done outside of the classroom (utilizing the environmental conditions around the school). This learning puts the student learning as subject (not the object) educated who interact directly with objects that are examined in the field (outdoor). This kind of learning leads to activity, creativity, and the students in the realm of the criticality cognitive, affective, and psychomotor).

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[10] Dandan Tufik. *Hakikat dan Fungsi Buku ajar* (http://masnurmuslich.blogspot.com/2008/10/hakikt-dan-fungsi-buku-teks.html. Diakses pada tanggal 27 Desember 2013)

[11] DE, *Definisi IPA (*http://de151515.blogspot.com,diakses 25 juni 2013 jam 08.58 wib)

7. Learning achievement assessment is education about development and progress of education with respect to student mastery of the lesson material presented to them and the values contained in the curriculum.[12] That means the results achieved by a student towards learning activities carried out at the school.

[12] Syaiful Bahri Djamarah, *Prestasi Belajar dan Kompetensi Gurur* (Surabaya: Usaha Nasional, 1994), page. 29.

CHAPTER II

REVIEWED OF LITERATURE

In this chapter will be discussed, (a) the previous research, (b) Reviewed of related literature which consists of 1) The nature of science, 2) Material structure and function of plant parts, 3) Understanding and acquisition concepts, 4) the characteristics of the materials, 5) Definition of constructivism methods, 6) Outdoor learning models in the learning, 7) learning Achievement

A. Previous Research

Some related research relevant to the development of learning materials is done by researchers, namely:

1. Research development carried out by Ainun Asmawati (2012) resulted in Biology Class XI Subjects Kontrukstivisme Based Learning Cycle Model. This research linkages with the title of the thesis that I take that produces teaching materials.
2. Development research made by Adhin Maulidya Nurwiga (2011) generating Practical Guidebook produce and Media IPA.[13] Research

[13] Adhin Maulidyah Nurwiga, Pengembangan Buku Panduan Praktikum dan Media IPA untuk Meningkatkan Prestasi Belajar Siswa Kelas V pada Materi Optik di MI Negeri Gedog Kota Blitar, *Skripsi* tidak diterbitkan, Program Pendidikan Guru Madrasah Ibtidaiyah,UIN Malang, 2011

linkages with the title of the thesis that I take that produces teaching materials as well as materials science research use development.

3. *Development of Instructional Materials Arabic Learning Class 5th with Rule Methods and Tarjamah in MI Syalafiayah Syafiiyah Mlandingan Situbondo* [14]. By Imam Shalihin. The study resulted in Arabic textbook students with principles and methods tarjamah.
4. *Development Learning of Textbook of Hadith Quranic Hermeneutics Approach for State Grade 5 Elementary School (MIN) 1 MALANG* [15]. By Fitrotul Uyun. This study teaching materials according to the researchers, learning appropriate when learning Quran Hadith Elementary School practiced approach to hermeneutics, so that knowledge of the material of the Quran and Hadith school and can internalize content understanding of the cognitive, affective, and psychomotor students. From the test results of the elementary instructional package design of this study, it can be concluded by the researchers that the research has met the eligibility criteria in the content and design aspects as well as tested meets the eligibility criteria in the aspects of content and design as well as empirically tested in the field and using the development desain Borg and Gall.

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[14] Imam Shalihin. *Pengembangan Buku Bahasa Arab Kelas 5 Dengan Metode Kaidah dan Tarjamah di MI Syalafiyah Syafiiyah Mlandingan Situbondo.* Prodi Pendidikan Guru Madrasah Ibtidaiyah, UIN Malang 2012.

[15] Uyun, Firotul. *Pengembagan Bahan Ajan Pembelajaran Al-Qur'an Hadis dengan Pendekatan Hermeneutik bagi kelas 5 MIN 1 Malang. Thesis.* Malang: program Pascasarjana UIN Maliki Malang. 2010.

Based on the conclusions previous studies related to general strengthening the development of the textbook that researchers have developed, there has been the development of research to develop the 4th grade science textbook material structure and function of plant. The textbooks are developed in accordance with the issues contained in SDN Turen 02 and needs analysis, that there are problems related to learning science textbooks, after observing the textbooks used textbooks turns out to not meet the level of good quality.

Development of textbooks developed by researchers with the use constructivism methods and outdoor learning models to construct or build knowledge students independently with various scientific investigation activities through observation and observation. The results of products with the development will be assessed against 3 experts validator , expert validator material/content, media experts textbook validator, the validator learning expert who is none other than science teachers of SDN Turen 02 and will be tested with individuals, small groups and test test field is the entire 4th grade students of SDN Turen 02 to know the determine the feasibility of components that include, validity, effectiveness and attractiveness of the textbook. Performed with pre-test and post-test textbook expected to increase the understanding of science concepts significantly especially material structure and function of plant.

B. Reviewed of Related Literature

Reiewed of related literature are as follows:

1. Reality of natural science

a. Understanding of IPA

Natural of science (IPA) is part of sience that originally comes from the English language *science*. The word of science is derived from the Latin *scientia* meaning I know. Scientia consist of *social sciencies* (ilmu pengetahuan sosial) and *natural science* (ilmu pengetahuan sosial) and *natural science* (ilmu pengetahuan alam).[16]

According to Fowler,

> Natural science (IPA) or *natural science* defined as: "*systematic and formulated knowledge dealing with material phenomena and based mainly on observation and induction"* (yang diartikan bahwa ilmu pengetahuan alam didefinisikan sebagai pengetahuan yang sistematis dan disusun dengan menghubungkan gejala-gejala alam yang bersifat kebendaan dan didasarkan pada hasil pengamatan dan induksi).[17]

According to Purnel's,

> "*Science the broad field of human knowledge, acquired by systematic observation and experiment, and explained by means of rules, laws, principles, theories, and hypotheses".* Artinya ilmu pengetahuan alam adalah pengetahuan manusia yang luas, yang didapatkan dengan cara observasi dan eksperimen yang sistematik, serta dijelaskan dengan bantuan aturan-aturan, hukum-hukum, prinsip-prinsip, teori-teori, dan hipotesa-hipotesa.

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[16] Trianto,*Model Pembelajaran Terpadu (*Jakarta: Bumi Aksara, 2010), page. 136

[17] *Contoh Artikel Tentang Hakikat IPA SD* (http://blog-kuliah.blogspot.com, diakses 1 juni 2013 jam 09.55 wib)

Referring to the understanding of the natural science (IPA), it can be concluded that the nature of science includes four elements, namely:

1) The attitude is curiosity about objects, natural phenomena, living beings, as well as the causal relationship gives rise to new problems and can be solved through the correct procedures.The second aspect is the science aspect of the process, the method of acquiring knowledge. This method is known as the scientific method that currently is the result of previous developments. Scientific method have a basic framework that can be taught procedure in six steps:
   a) Aware of the existence of the problem and the formulation of the problem.
   b) Observation and collection of relevant data.
   c) Preparation or data classification.
   d) Formulation of hypotheses.
   e) Deductions and hypothesis.
   f) Tests and testing the truth of the hypothesis.

   In teaching process science of this process appears in the form of teaching and learning activities. There are aspect in the teaching process whether or not depends on the teacher. One theory is written in the textbooks can be taught, but can also be taught to carry a problem concretely to perform a variety of physical and mental activity until finally reformulate the theory that has been written.

2) Product, the product term applied to the principles, laws and theories in the science stated that knowledge, principles, law or theory it is the custom or man-made in order to understand and explain natural phenomena that occur. Thus it can be said that science is a system developed by humans to know determine the state of the self and its environment. IPA as a product of science includes concepts, laws and theories that developed as the fulfillment of human curiosity and for practical purposes. In teaching science, aspects of the product appears in the form of subject that is often presented as a theory of knowledge or finished without any legal theory or explanation of how it was obtained.[18]
3) Applications that means have the application of scientific method and science concepts in everyday life.[19]

The four element is an characteristic of real science can not be separated from each other in the process of learning science four elements that are expected to arise, so that students can experience learning process complete, to understand natural phenomena through problem-solving activities, scientific method, and imitate the way scientists work in discovering new facts.[20]

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[18] Muhammad Riza, *Karakteristik Pembelajaran SD/MI* (http://www.scribd.com/doc/17087298/Karakteristik-Pembelajaran-IPA-SD, diakses pada tanggal 23 juni 2013 jam 23.00wib)

[19] Tim Pustaka Yustisia, *Op.cit.*, page. 283

[20] Anita Wahyu Lestari,*"Pengembangan Perangkat Pembelajaran IPA SMP Berbasis Kooperatif Tipe STAD Tema Fotosintesis di SMP Giki-3 Surabaya",* Skripsi,Program Studi Pendidikan Sains, Universitas Negeri Surabaya, 2012

b. Characteristics IPA

Natural Science is defined as knowledge gained through data collection with experimentation, observation, and deduction to produce an explanation of a phenomenon that can be trusted. There are three capabilities namely IPA:[21]

1) Ability to know what is observed.
2) Ability to predict what has not been observed and the ability to test the result of follow-up results of the experiment.
3) The development of a scientific attitude.

Science learning activities covers the development of the ability to ask questions, seek answers, understand the answers, complete answers about "what", "why" and "how" of natural phenomena and the characteristics of the natural surroundings in ways that will be applied in a systematic environment and technology. These activities are known to the scientific activities that are based on the scientific method.[22]

In a science lesson students directed to compare the results of predictions theory with learners through wants by using the scientific method. Education of science in the schools can be a vehicle for students to learn about themselves and the natural surroundings, as well as the possibility of further developments in applying it in everyday life, which is based on the scientific method, science teaching emphasizes direct experience to develop competencies that learners are able to understand

[21] *Ibid*,. page. 284
[22] *Ibid*

the natural surroundings through process of "figure it out" and "do", it will help students to gain a deeper understanding. The skills to find out and do it is called as the skills of investigation or inquiry process skills which include observing, measure and classifying, ask questions, and so on. Process skills developed through skills attitudes and values which include curiosity, honest, patient, open, not superstitious, critical and diligent.[23]

c. The purpose of learning science

Teaching science subject at the elementary school/MI intended that learners have the ability as follows [24] :

1) Understand the concepts of science and its relation to everyday life.
2) Have the skills to develop a process of knowledge and ideas about the nature around him.
3) Have an interest to know and study the objects, plants as well as events in the surrounding environment.
4) Being curious, diligent, open, critical, introspective, responsible work together as well as independently.
5) Ability to apply science concepts to explain natural phenomena and problem solving in everyday life.
6) Ability to use simple technology that is useful for solving a problem that is found in everyday life.

[23] Tim Pustaka Yustisia,*Op.cit.*, page. 283

[24] *Peraturan Menteri Pendidikan Nasional Republik Indonesia* Nomor 22 Tahun 2006 Tentang Standar Isi untuk Satuan Pendidikann Dasar dan Menengah (Jakarta:BSNP, 2006), page. 168

7) Identify and foster a love of the environment, thus realizing the greatness and majesty of God Almighty.

While, according to Teaching Program (GBPP) Elementary School stated that the purpose of learning Natural Sciences or Science are as follows:

1) Instilling a curiosity and a positive attitude toward technology and society.
2) Develop skills to investigate natural procwsses around, solve problems and make decisions
3) Instilling knowledge and understanding of science concepts that will be useful and can be applied in everyday life.
4) Develop an awareness of the role and importance of science in everyday life.
5) Source use knowledge, skilss, and understanding to other areas of teaching.
6) Participated in maintaining, protecting and preserving the natural environment.
7) Appreciate the creation of God will be the natural environtment.

The goal and purpose is to make the children have knowledge of the nature phenomena and the various types and role of the natural environment of the artificial environment through observation so that children are not blind to the knowledge base by about IPA or Science.

d. The scope of Materials Science Class IV SD / MI

According to the written in the curriculum unit level of education, learning science in the fourth grade Elementary School / MI includes the study of materials contain aspects of "living things and life process, humans, animals, plants and their interaction with the environment and health", objects and properties include liquid, solid, and gas, "energy" and changes include style, sound, heat, magnetism, electricity, light, and light aircraft "as well as a discussion of" the earth and the universe which includes the land, the earth, the solar system and the objects other sky "which is divided into a few of basic standard and basic competencies are presented in two semesters. Learning science in the fourth grade first semester (one) includes several standard competencies as follows:

1) Understanding the relationship between the structure of human body organs to function, as well as maintenance.
2) Understand the relationship between the structure of plant with their function.
3) Classify animals based on the type of food.
4) Understand the life cycle of various types of living things.
5) Understand the relationships among living things and between living things with their environment.
6) Understand the diverse nature and change of form object as well as various ways of its use based on those objects.

The scope of the competency standard IPA 4th grade first semester (one) in elementary school curriculum content standards in 2006 and used as the study material is the standard of competence "Understanding the relationship between the structure of plant parts to function".

2. Material of the Structure and Function of Plant

The following summary of the material will be presented the Structure and Function of Plants Part taught in Elementary School/ MI and plant material in the Qur'an.

a. Material of the structure and function of plant parts

Structure and function of plant can be divided into five parts, 1) Root body serves as a foundation plant, absorb water and minerals as well as breathing, 2) Stem function as transporters of water and minerals, plants body plants store food reserves, 3) Leaf functional as a place of photosynthesis, plant respiration, where the evaporation process, 4) Flower functions as a plant breeding tool (tool marriage), 5) Fruits and Seeds serves to produce new plants.

b. Plant in the Qur'an

The plant is one of the creation God as a complement to the humans and other creatures. As the needs of humans, plants a source of food, drinks, clothes, furniture and others. Religion Islam is a noble religion of Allah, who have the holy book of the Qur'an as a guide in life. In the Qur'an many

verses that describe God creatures living in the world in the form of the following plant:[25]

a) QS.Qaf ayat: 9

وَنَزَّلْنَا مِنَ ٱلسَّمَآءِ مَآءً مُّبَٰرَكًا فَأَنۢبَتْنَا بِهِۦ جَنَّٰتٍ وَحَبَّ ٱلْحَصِيدِ ۝٩

Artinya: *"Dan kami telah turunkan dari langit air hujan yang penuh keberkahan maka kami tumbuhkan dengannya tanaman pepohonan yang rindang dan biji-bijian yang dipanen"* (QS. Qaf:9)[26]

b) QS.Al-A'la ayat: 4

وَٱلَّذِىٓ أَخْرَجَ ٱلْمَرْعَىٰ ۝٤

Artinya: "*Dan Allah SWT mengeluarkan rumput-rumputan"* (QS. Al-A'la:4)[27]

c) QS.AR-Rahman ayat: 6

وَٱلنَّجْمُ وَٱلشَّجَرُ يَسْجُدَانِ ۝٦

Artinya: *"Dan tumbuh-tumbuhan dan pepohonan keduanya tunduk kepadannya"(Allah)* (QS.AR-Rahman:6).[28]

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[25] Departemen Agama RI. *Al-Qur'an dan Terjemahannya.* (Jatinegara-Jakarta, CV. Darussunah:2006).

[26] Ibid. page. 519

[27] Ibid page.592

[28] Ibid., page.532

3. The Understanding and obtaining concept

Understanding is the translation of the term can be interpreted as meaning the absorption of a material being studied. In the dictionary of the Indonesia Language, said that understanding the exact meaning, while the meaning of a design concept. Learners can be said to understand a thing when it is properly understood and be able to explain.[29]

Understanding of mathematical ability is one of the important objectives of a lesson, giving the sense that the material taught to students not only as a rote, but more than that. With an understanding of the students can better understand the concept of the subject matter itself. Mathematical understanding is also a purpose of any material that will be presented by the teachers, because the teacher is supervising students to achieve the expected concept.

Using the definition of a concept, a concept statement in a form that is useful to plan a teaching unit is a description of the properties or process, structure or quality that is expressed in a form that indicates what should be depicted or described so that students can perform perceptions to the process, structure, or quality for himself.

From some explanations of the concepts of understanding, it can be concluded that the understanding of the concept is the ability to capture and control more a number of facts that have a relationship with a particular meaning. Understanding of important concepts for students to understand

[29] Simahmoet,*Definisi Pemahaman Konsep* (http:ahli-definisi.blogspot.com, diakses 23 desember 2013 jam 22.00 wib)

the correct because the students can absorb, retain and store the material learned in a long period of time.

4. Characteristics of Subject

a. Understanding of Materials

Teaching material is anything that contains the message to be delivered to students such as books, magazines, newspapers, and other printed materials. According Pannen, teaching materials are materials or subject matter is arranged systematically used by teachers and students in the learning process.[30] There are other definitions of the information material, and text tools necessary teacher/instructor for a planning and implementation of a learning and can also assist in implementing the teaching and learning activities in the classroom. The materials in question can be written material or material not written (*National Center for Vocational Education Research Ltd/National Center for Competency Based Training).*[31]

b. Function of Materials

Function in the creation of learning materials is as follows:

a) Guidelines for teachers that will lead to all the activities in the learning process, as well as a substance competence that should be taught to students.

[30] Fitratul Uyun,*op.cit.,* hlm.1.

[31] Depdiknas, *Pengembangan Bahan Ajar (*Jakarta: Direktorat Jenderal Manajemen Pendidikan Dasar dan Menengah, Direktorat Pendidikan Sekolah Menengah Atas, 2008), page. 7

b) Guidelines for students who will direct the activities in the learning process, as well as a substance that age competencies learned / mastered.

c) The evaluation of achievement / mastery of learning outcomes.

c. The Purpose of the Teaching Materials

In addition to the materials compiled, also has a meaningful purpose to teachers or students who live and use it in an learning activities in the classroom, the objectives are as follows:[32]

a) Provide instructional materials in accordance with the demands of the curriculum taking into account the needs of the students, the teaching materials appropriate social and environmental characteristics of the learners.

b) Assist students in obtaining alternative learning materials in addition to the textbooks that are sometimes difficult to obtain.

c) Facilitate teachers in implementing a learning.

d. The Principle of Teaching Materials

The development of teaching materials and let the of a learning. Among the principles of a learning, whih is a:[33]

1. Starting from an easy to understand that difficult, from the concrete to the abstract understanding. Students will be more to understand a particular concept in the explanation or something concrete, something tangible in their environment.

[32] *Ibid.,* page. 9
[33] *Ibid.,* hlm. 10-11

2. Repetition will strengthen an understanding. In a learning, repetition is necessary for students to better understand a concept. But repetition in writing learning materials must be appropriately presented and varied so it is not boring.
3. Positive feedback will provide reinforcement to the students' understanding. Often we take lightly to give a modest response on the work of the students. Though the response given by the teacher as "yes true" or "yes, you're smart" will give a confidence to the learners that he has answered or do anything right.
4. Motivation of high learning is one of the critical success factors of learning. A student who has a high learning motivation will be more successful in learning. To that end, one of the teachers in implementing the learning task is to provide encouragement (motivation) to make students want to learn.
5. Achieving the goal. In this case study is a gradual and continuous process. To achieve a high standard of competence, need a goal. To that end, the teacher will need to develop a learning goal according to the characteristics of learners.
6. Knowing the results achieved will encourage students to continue to achieve the goal.

e. Form of the developmnet of learning materials

Learning materials developed by researchers are the form of print media in the form of textbook-based constructivism. It contains a material

that is the subject of the structure and function of plant parts. The material will be broken down into several sub subject include: roots, stems, leaves, flowers, fruits, seeds, and in it there will be a simple experiment and observation.

Development is a process to translate design specifications into a particular physical form. The process of translating the design specifications include the identification of problem formulation of learning objectives, development of strategies or methods of learning and evaluation of effectiveness, efficiently, in a study.[34]

Development in a very general sense means growth, changes slowly (evolution), and changes gradually. This understanding is then applied in various fields of study and practice are different. While in the field of learning technology (instructional technology), development as a means to translate or describe the process of design specifications into physical form. Or in other words, means that the process resulted in the development of learning materials.[35]

Developing a product of learning, especially science textbooks required in order to learn students with an easy, fast, interesting and not boring in order to achieve optimal learning outcomes to be achieved. It is also supported by the achievement of the learning process that should be

[34] Fitratul Uyun,*Pengembangan Bahan Ajar Pembelajaran Al-Quran Hadits Dengan Pendekatan Hermemeuntik Bagi Kelas 5 Madrasah Ibtidaiyyah Negeri (MIN) 1 Malang*, Program Studi Pendidikan Guru Madrasah Ibtidaiyyah (PGMI), Universitas Islam Negeri (UIN) Maulana Malik Ibrahim Malang, 2010.

[35] Setyosari, Punaji.. *Metode Penelitian Pendidikan dan Pengembangan.*(Jakarta: Kencana, 2010), page. 197

followed in any educational institution as stated in Government Regulation. 19 Year 2005 on National Education Standards, Article 19, paragraph 1, namely:

> "Adapun proses pembelajaran pada satuan pendidikan hendaklah diselenggarakan secara interaktif, inspiratif, menyenangkan, memotivasi peserta didik untuk berpartispasi aktif serta memberikan suatu ruang yang cukup bagi seorang prakarsa, kreativitas dan juga kemandirian sesuai dengan bakat, minat dan perkembangan fisik serta psikologis peserta didik"[36]

A book usually will contain something of the thoughts of the author. If a teacher is preparing a book used as a teaching material then his thoughts must be derived from KD as stipulated in the curriculum, so that the book would make sense as teaching materials for learners who will be learn.

A book will be starting with the background of writing, the definition / meaning of the title is presented, the scope of the discussion of explanation in the book, the law or the rules are discussed, examples are needed, the results of research, data and interprestation, various arguments corresponding to presented. The step that can be done by a teacher in writing the book is as follows:

a) Determines the title of a book that will be written in accordance with the decree of the book will be provided.
b) Designing the outline of the book so that the book is more complete and covers all aspects needed to achieve competency.
c) Collect reference as writing materials, try to use the most current and relevant reference materials studies.

[36] Permen No.19 Tahun 2005 tentang Standart Nasional Pendidikan, Pasal 19 ayat 1

d) Writing a book is done by looking at the presentation of sentences that are tailored to the age and experience of readers.

e) Evaluate / edit the posts by means of re-reading. If there is a shortage of immediate replenishment.

f) Improve writing

g) Use a variety of learning resources that can enrich the learning material such as books, magazines, internet, journal of research results.

5. Constructivism

a. Definition of Constructivism

According to Hill, the theory of constructivism is defined as a generative learning, ie the act of creating something of meaning of what is learned. Differences with the flow behaviouristik who understand the nature of learning as an activity that is mechanistic between stimulus response, while constructivism better understand learning as a human activity to build or create knowledge by giving meaning to the knowledge of experience. According to this theory, the fundamental principle is that teachers do not only impart knowledge to students, but students must also take an active role in constructing their own knowledge in its memory.[37]

According Shymansky, argues that constructivism is an active activity, where learners build their own knowledge, searching for the meaning of what they learned, and a finishing process concepts and new

[37] Agus N. Cahyo, *Panduan Aplikasi Teori-Teori Belajar Mengajar Teraktual dan Teropuler* (Jogjakarta: Diva Press,2013), page. 34-35

ideas within existing frameworks and its.[38] As for the formation of knowledge constructivism which views an active subject creates cognitive structures in interaction with the environment.

In this theory of constructivism has also emphasizes that in a learning process, educate participants should receive emphasis. Students must also actively developing a knowledge, not the learner or others. Students also must take responsibility for their learning outcomes. The emphasis of this active student learning needs to be developed. Learning is more focused on experimental learning is an adaptation of humanity based on the concrete experience of being in laboratorium, discussions with classmates, who then made the idea and develop a new concept. Therefore, educating and teaching does not focus on the teacher as an educator but rather on the learner.

b. Characteristics of Consructivisme

According to Hanafi as a constructivist approach new approaches in the learning process has characteristics as follows:

1) Student-centered learning process so that students are given great opportunities to be active in the learning process.
2) The learning process is a process of integrating new knowledge with a long knowledge of the students.
3) Different views among students appreciated and as tradition in the learning process.

[38] *Ibid.* page 35-36

4) Students are encouraged to find a wide range of possibilities and synthesized in an integrated way.
5) The process of problem-based learning in order to encourage students in the search process *(inquiry)* is more natural.
6) The learning process encourages cooperative and competitive among students perpetually active, creative, innovative, and fun.
7) The learning process is done contextually, ie students exposed to the real experience.

c. The principles of constructivism learning theory

The principles of constructivism applied in teaching and learning are as follows:

1) Knowledge constructed by the students themselves.
2) Knowledge can not be transferred from the teacher kemurid, but only with my own students to make sense of liveliness.
3) The students can to more continuously active, so it is always a change in scientific concepts.
4) Teachers simply help provide advice and situations that the construction process was smooth.
5) Facing issues relevant to students.

Adjust the curriculum to respond to the notion of students. From there it is only one of the most important principles is the teacher should not merely impart knowledge to students. Students must construct their own knowledge in mind. A teacher can help this process by teaching the ways

of making the information very meaningful and relevant to students, by providing opportunities for students to discover or implement their own ideas and to encourage students to recognize and use their own strategies for learning. Teachers can give students the stairs to where the ladder was later intended to help them achieve a higher level of understanding.

6. Learning Method of *Outdoor Learning*

a. Understanding *Outdoor learning*

According Hariyanti that argue, learning outside the classroom is a learning process that can construct meaning (input), then the process through cognitive structures so long memorable in memory or memory (happens reconstruction).

Outdoor learning can be simply defined as experiential learning in, for, or about the outdoors. The term ‘outdoor education’, however, is used broadly to refer to a range of organized activities that take place in a variety of ways in predominantly outdoor environments. Common definitions of outdoor education are difficult to achieve because interpretations vary according to culture, philosophy, and local conditions.

b. The Purpose of the outdoor learning models

learn how to overcome adversity enhance personal and social development develop a deeper relationship with nature. Outdoor education spans the three domains of self, others, and the natural world. The relative emphasis of these three domains varies from one program to

another. An outdoor education program can, for example, emphasize one (or more) of these aims to:

1) Teach outdoor survival skills
2) Improve problem solving skills
3) Reduce recidivism
4) Enhance teamwork
5) Develop leadership skills
6) Understand natural environments
7) Promote spirituality

c. Forms of outdoor learning models

The following forms of outdoor education learning into a new business area in the world of education:

1. *Education*, *Training Plus*

Is an educational activity is essentially the same as other formal school. Students will continue to receive lessons in accordance with the curriculum of national education department. Learning methodology that integrates formal curriculum of learning always, nature and character. For national education curriculum subjects such as: Art, Science, and others familiar with the patterns of nature while playing around. Curriculum characters more personality and character while kepembentuklan natural curriculum includes lessons and get to know plants gardening, raising animals and know. In order to hone the mental

independence and learners. This activity can be used by participants in the school age (kindergarten s / d SMA).

2. *Gathering Plus*

   Is a form of outdoor in the open which is designed in a recreational atmosphere, relaxed and happy with the charge educative.

3. *Playground and Nature tours*

   Is a series of obstacles that the game is designed so that it can be simulated outdoor activities. This activity opens potential that has not been known so through Low and High Rope activities this comes a sense of confidence.

4. *Eksperiental Base Study*.

   Is a learning activity packs deigned in such a way that it can be applied by using the outdoors as a medium. The process of self-knowledge, interests and talents based on the school-curriculum so that the program is very effective for the participants as they engage to see, hear and act immediately (eksperiential learning). This program is designed for excellent schools to continue prioritizing school safety and comfort factor.

5. *Knowledge Management*

   Is the distribution of packaging knowledge will be learning together. Knowledge management has been formulated as a source sains together and can be implemented with a sense of nature to sit

under this program can be used by companies, institutions and leading schools of the city.

d. Excess of *Outdoor learning*

Learning Outdoor learning model can be applied to school age children and adults as well. According Sudjana and Rival explains, a lot of the benefits of ferreting out environmental activities in the learning process, among others:

1) Learning to observe the realities of the diverse close.
2) Learners can answer questions or problems with the saw, heard, tried and proved directly.
3) Learners can learn something in the integral and comprehensively.
4) Information wider study materials and actual.
5) Learners are accustomed to seeking and processing the material itself.
6) Learners and students feel more than happy.
7) Extend the interest and liveliness.
8) Eliminate bored.

e. Weakness of *Outdoor learning*

According Sudjana and Rival some weaknesses and deficiencies that often occur in the implementation of learning activities Outdoor Learning revolves around the timing of technical and learning activities, among others:

1) Method of learning outdoor learning requires excellent management from planning, implementation, and evaluai, so teachers should coordinate with various parties including the community around the school.
2) Method of teaching outdoor learning is not only led by one of the science teacher but involve other teachers as mentors.
3) Learning outdoor learning method requires strict control of the elements of teachers, principals and parents.
4) Learning methods require learning outdoor learning resources from the environment around the school so that the school must provide competent learning facilities.
5) Learning method tends only outdoor learning oriented recreational activities are not emphasized on the aspect of a motor skills.

7. Learning Achievements

a. The Understanding of Learning Achievements

The term learning achievement is often used to idicate the process of achieving a level of success on the business of learning that has been done. Learning is often associated with activities that make a difference to every individual, both in terms of the change of habits, knowledge, skills, and attitudes as well as regarding changes in some aspects of human habits that can not be separated from the personality. If related to the concept of learning the terms of learning achievement will lead to a learning goal. Behavioral changes caused by someone achieve mastery of a number of

materials that have been given in the learning process. Based on the achievement of predetermined objectives and teaching can be changes in the cognitive, affective and psychomotor.[39] Islam teaches all Muslims to compete in goodness. As is written in the words of Allah in the letter (Surat al-Baqara: 148) is as follows:

وَلِكُلّٖ وِجۡهَةٌ هُوَ مُوَلِّيهَاۖ فَٱسۡتَبِقُواْ ٱلۡخَيۡرَٰتِۚ أَيۡنَ مَا تَكُونُواْ يَأۡتِ بِكُمُ ٱللَّهُ جَمِيعًاۚ إِنَّ

ٱللَّهَ عَلَىٰ كُلِّ شَيۡءٖ قَدِيرٞ ١٤٨

Artinya: *"Dan bagi tiap-tiap umat ada kiblatnya (sendiri) yang ia menghadap kepadanya. Maka berlomba-lombalah (dalam membuat) kebaikan. di mana saja kamu berada pasti Allah akan mengumpulkan kamu sekalian (pada hari kiamat). Sesungguhnya Allah Maha Kuasa atas segala sesuatu."(QS. Al-Baqarah:148)*[40]

The verse above implies that all Muslims are required to compete in terms of learning. In the study, each student must compete to obtain a good learning performance, because it is also good.

b. The Purpose of Student Achievements

Basically every human being that performs all activities in life can not be separated from the objectives are achieved. Due to the presence of the goal will determine the direction the person will be under or directed. So the goal learning is central to every student achieve those goals at least the

[39] Purwanto, *Evaluasi Hasil Belajar* (Yogyakarta:Pustaka Pelajar, 2009), page. 46
[40] *Al-Quran dan Terjemahannya,* (Bandung/: Al-Ma'arif. 1990), page.22

students themselves, can even known who is responsible for the success or failure of learning activities that mostly relies on the students themselves. As revealed by Drs. Oemar Hamalik that:

> Kesuksesan itu bagian besar terletak pada usaha kegiatan saudara sendiri, sudah barang tentu faktor keamanan, minat, ketentuan, tekad untuk sukses, cita-cita yang tinggi merupakan unsur mutlak yang bersifat mendukung usaha saudara itu.[41]

c. Principles of Student Learning

The learning process is a complex process, but it can be analyzed and specified in the form of learning principles. The definition of achievement is the results acjieved, being referred to the principle of learning are things that can be used as a guide in the learning process. The fundamental principles by Slameto namely:

1) The students learning should be sought active participation, increase the interest and guide to achieve instructional goals.
2) The Learning is a continuous process, so it should be based on development stage by stage.
3) Learning requires sufficient means so that students can learn to calm.[42]

From some of the opinion above, the principles of the above-mentioned study, the authors can conclude that earnestly and have goals in learning is the ultimate goal for learning in the absence of discipline, will, purpose and high ideals should not absence two-way relationship between student and teacher.

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[41] Oemar Hamalik, *Metode Belajar dan Kesulitan-kesulitan Belajar* (Bandung: Tarsito, 1983), page.2

[42] Slameto, *Bimbingan di Sekolah.* (Jakarta: Bina Aksara, 1988), page. 28

CHAPTER III

RESEARCH METHOD

On the third chapter will be discussed of research and development methods, the methods is as follow, (a) research method, (b) development model, c) development procedure, d) trial test product.

A. Research Method

This research use the kind of research and development (Research and Development). Research and Development (R & D) is a research method that used to produce a particular product, and test the effectiveness of these products.[43] This types of R&D here is research of development that oriented products in the field of education. According to Nana Syaodih Sukmadinata in his book titled Education Research Methods that research and development (R&D) is a strategy or a pretty powerful reerach method in repairing practice.[44]

While according Borg & Gall, research and development is a process which used develop and validate product education.[45] To be able to produce certain products that are used research and analysis needs to examine the effectiveness of these products in order to function in society at large, it is

[43] Sugiyoyono, *Metode Kuantitatif, Kualitatif dan R&D,* (Jakarta : Alfhabeta, 2008), page 93

[44] Nana Syaodih Sukmadinata, *Metode Penelitian Pendidikan,*(Bandung: PT Remaja Rosdakarya, 2007). Page 164

[45] Setyosari, Punaji, & Sihkabuden,*op.cit.* page.194

necessary to study to test the effectiveness of these products. so the research and development of longitudinal/stages.[46]

B. Development Model

This research use developmnet model Walter Dick and Lou Carey[47]. Dick, Carey and Carey view instructional design as a system and consider learning is a systematic process. In fact a systematic way of working this expressed as a systems approach model. Reinforced by Dick, Carey and Carey systems approach always refer to the general stages of learning systems development (Instructional Systems Development / ISD). When talking about the design then goes into the process, and if you use the term instructional design (ID) refers to the Instructional system development (ISD) is the stages of analysis, design, development, implementation, and evaluation.

View instructional design as a system and considers learning is a systematic process. In fact this is how the systematic approach expressed as a model system. Reinforced by Dick, Carey and Carey systems approach always refer to the general stages of learning systems development (Instructional Systems Development / ISD). When talking about the design then goes into the process, and if you use the term instructional design (ID) refers to the Instructional system development (ISD) is the stages of analysis, design, development, implementation, and evaluation.[48]

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[46] *Ibid*

[47] Sugiyono, *Metode Penelitian Pendidikan,*(Bandung, Alfabeta, 2013), page. 407

[48] Walter Dick an Lou Carey, *The Systematic Design of Instruction* (Glecview, Ilionis: Scot, Foreman and Company USA, 1987), page. 8

Dick and Carey model consists of 10 steps. Every step very clear goals and objectives so that it is suitable for novice designers as a basis for studying the design model. Ten of step Dick and Carey model showed a very clear, and uninterrupted between one step and another. In other words, the system contained in the Dick and Carey is very concise, but the content is solid and clear from one sequence to the next sequence.

This research designed usea model the development of Walter Dick and Lou Carey [49]. In the model of Dick and Carey are 10 stage of instructional design but in the development model is only used 9 stages. This is done with the consideration that made only textbook conducted only limited testing ptotopie product. Stages tenth (suamatif evaluation) is not done because outside of the system of learning, so that this development is not used.

C. Development of Procedure

Based on the design of learning systems approach model Walter Dick and Lou Carey as mentioned above, the development of research in the development of the procedures it follows the steps instructed in the design model as follows:[50]

1. **Identifiying General Purpose of Learning *(Identifying Instructional Goal)***

   The first step identifies the general purpose of learning science by doing a needs analysis to determine the destination. This step means

[49] Walter Dick and Lou Carey, *The Systematic Design of Instruction* (USA: 1987), page. 8-11

[50] Trianto, *op.cit.*, page. 63

determining what steps it wants to be able to do the learners learning activities after following science. The general objective is a statement that describes what capabilities should be owned by the student after completion follow a lesson. The general objective of the analysis needs be identified based on those results, the curriculum areas of study, input from experts fields of study. Analysis of standards of competence and basic competences subjects of Natural Science 1 semester of 4th grade are as follows:

Table 3.1.

The General Learning Objectives IPA in class 4th
Semester 1 Material Structure and Function of plant SD/MI

Compenetnce Standart	Base Competence
Living Things and Life Process 1. Understanding the relationship between the structure of human body organs to function, as well as maintenance	1.1 Describe the relationship between the skeletal structure of the human body to function 1.2 Implement how to maintain the health of the body skeleton 1.3 Describe the relationship between the structure of the five senses eith its function 1.4 Applying how to maintain the health of the five senses
2. Undestanding the relatinship between the structure of plants parts to function	2.1 Explain the raltionship between the structure of the roots of plants with their functions. 2.2 Explain the relationship between the structure of plant stems with their function. 2.3 Explain the relationship eween the structure of plant leaves with function. 2.4 Explain the relatinship

	between the structure of flower plants with the function.
3. Classify animals, based on the type of food	1.1 Identify the types of pet food 1.2 Classifying animals by type of food
4. Understanding the life cycle of many kinds of living things	4.1 Describe the life cycle of some animals in the surrounding environment, such as cockroaches, mosquitoes, butterfly, and cas. 4.2 Show concern for pets, such as cats, chiken, fish
5. Understand the relationship among living things, and between living things with the environment	5.1 Identify some of the typical types of relatinship (symbiosis) and "eat and be aeten" between living beings (food chain) 5.2 Describe the relatinships between living things and their environment.
Objects and nature 6. Understand the diverse nature and changes of form objects and how to use objects based on its	6.1 Identifying the form of solid-state, liquid and gas have certain properties. 6.2 Describe the occurrence of change in form liquid becomes solid, solid become liquid, the liquid become to gas, the gas becomes liquid, solid to gas. 6.3 Describe the relationship between the material properties of their role.

2. Implemetation the laerning analysis *(Conducting Insructional Analysis)*

After identifying the learning objectives, the next step is to conduct an analysis to identify the innate skills that students must learn in order to achieve specific learning objectives.

Table 3.2.

Results of the analysis of the connection of the indicators and the basic compentency of learning the science in the class 4th semester material structure and function of plant

Compentence Standart	Base Competence
Living Things and life process 1. Understanding the realtionship between structure and functionof plant parts	1.1 Explain the relationship between plant structure with function 1.2 Explain the relationship between the structure of the stem of the plant with the function 1.3 Explain the relationship between the structure of the leaves of the plant with the function. 1.4 Explain the relationshiip between the structure of the flower plants with the function.

3. Understanding behaviour of feedback and student characteristic *(Identifying Entry Behaviours, Characteristics)*

Researchers identify caharacteristicd of gare 4th SDN Turen 02, includes the actual ability of the student, learning style, and attitude toward learning attivities.

4. **Formulating the specific purpose of learning** ***(Writing Performance Objectives)***

   Specific learning objectives used in developing the most basic model of the outdoor learning strategies of learning and preparing lesson plans that teachers do in the classroom learning process. As for the specific purpose of learning erkait product development textbook material structure and function of the following plant:

   a. Students are able to identify the roots of plants and their functions for the plant itself.
   b. Students are able to identify the stems of plants and its function for the plant itself.
   c. Students are able to identify the leaves of plants and plant and function for itself.
   d. Students are able to identify the parts of flowers, fruits and seeds of plants and plant and function for itself.

5. **Developing Standard Reference Test Item** ***(Developing Criterion-Referenced Test)***

   Based on the above formulation of specific objectives, can be formulated in the form of the following assessment test instrument:

   a. Describe what the meaning of plants?
   b. Mnetion 5 parts of plants you knowing !
   c. Describe the structure and functin of plant parts!
   d. Explain the structure of the root, types and ther functions to plants!

e. Explain the structure of the stem plants, type of rod and rod functions for plants!

f. Describe the stucture and function of the plant leaves, and specify 4 types of classification based on leaf veins!

g. Describe the structure and function of flowers and seeds of plants!

6. Developing a Learning Strategy *(Developing Instructional Strategy)*

This step is an effort to select, organize, and develop common learning components and procedures that will be used for the students so that students can learn to easily fit characteristics in achieving the learning objectives that have been set. Learning component includes:[51]

a. Activities of the pre study

This activity is an activity which will open the lesson that aims to condition students learning readiness through the following steps:

1) Identifiying of characteristic the student

This activity is an activity which will open the lesson that aims to condition students' learning readiness through the following steps.

2) Raise teh motivation of learning students

Raises students' motivation is very important for students to maximize their learning activities. In addition, these activities are intended to foster interest and motivation to study science subjects in the study. This activity is usually done by describing the subjects

[51] Trianto,S.Pd. M. *Op.,cit.* Page. 116-119

to be delivered, through concept maps, and indicators of learning outcomes to be achieved.

3) Delivery of learning content framework

   This activity is done to provide a general overview of the subject matter content framework.

4) The presentation of information

   After doing the above activities, the next step is doing activities presentation or delivery of material content information. Based on the analysis stage of formulation science learning goals, standards and basic competencies along with the educational aspects of the indicator has been adjusted. In the course of the delivery of the content of the learning materials is done as follows:

   a) first: students are invited to associate previously existing knowledge with new knowledge that will be studied.
   b) Second: then the teacher gives an explanation megenai subject matter and students to pay close attention.
   c) Third: one of the students were asked to mention the experience that ever happened in accordance with the topic of discussion.
   d) Fourth: teacher mrmbimbing students associate the material with daily living environment.
   e) Fifth: students are invited emndiskusikan some discussion topics that have been delivered with mengidentifikai various kinds of problems they have caused.

f) Sixth: teacher guided students to conduct outdoor learning learning directly by giving group assignments and tasks independently.

g) Seventh: reflections of students or teachers.

7. **Selecting and Developing Leraning Materials *(Developing and Selecting Instruction)***

Principal steps of the learning system activity of Natural Sciences (IPA) is the selection of materials and the development steps of learning. The results of product development in the form of printed material in the form of learning science textbook Elementary School fourth grade about the "Textbook Development class IV Materials Science Structure and Function of Plants" which this text is presented with some median learning according to students' needs.

8. **Designing and conducting Formative Evaluation *(Designing and Conducting Formative Evaluatin)***

Formative evaluation was conducted to obtain data used to revise instructional materials that have been produced. Formative evaluation was conducted in two subjects. The first test is the content expert teachers of science and the two students who were the subject of research.

9. **Revise Learning Materials *(Revising Instruction)***

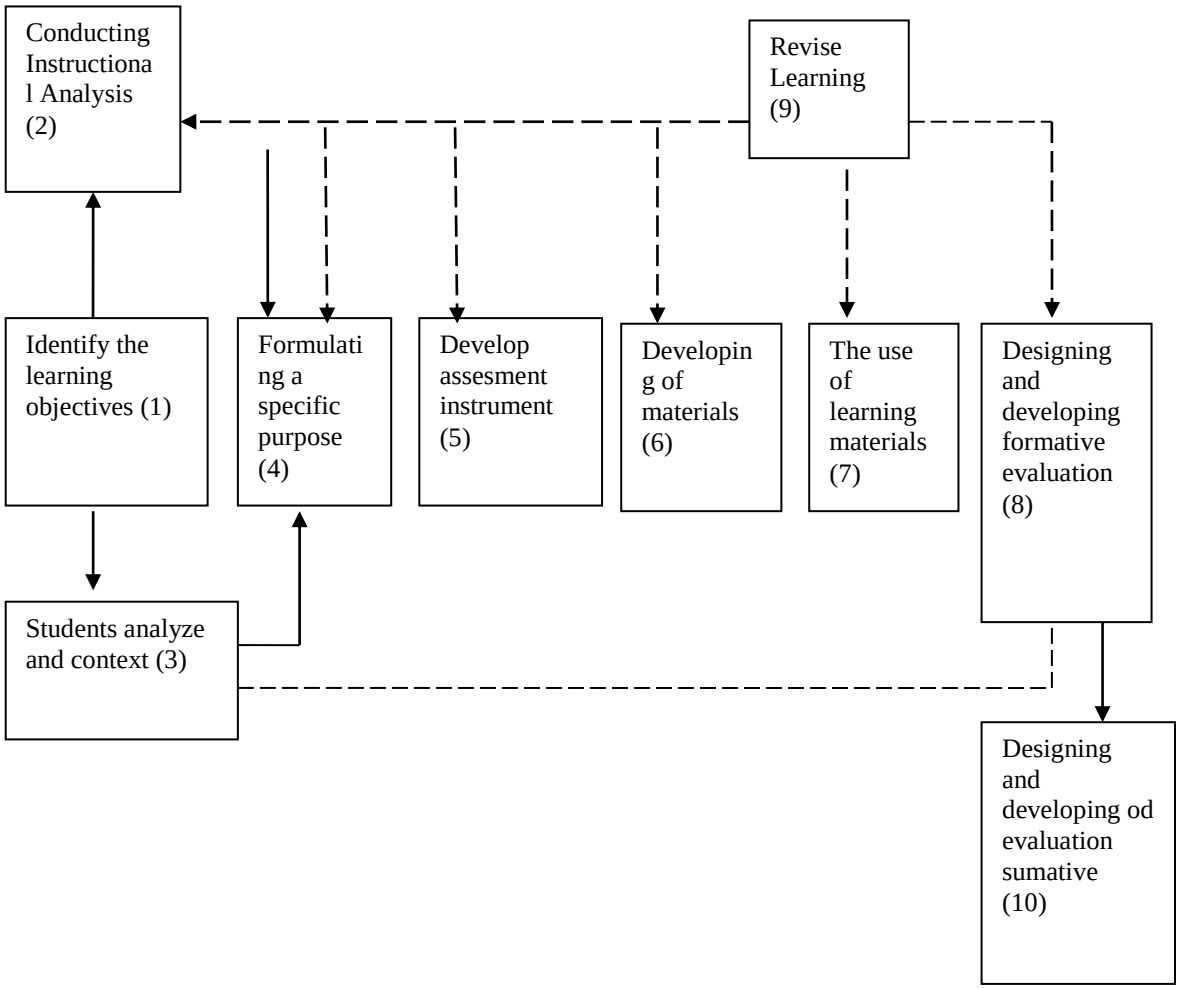
This step is revising the learning step. All data collected from the results of the formative evaluation was later analyzed to obtain fixes aimed

to solve the difficulties faced by students in achieving its goal of learning and also to revise the learning that takes place actively and effectively.

10. Designing and Conducting Summative Evaluation *(Designing and Conducting Summative Evaluation)*

Producing teaching materials that have been revised in learning to apply and see if the teaching materials capable of making students better value than the previous one.

Image 3.1
Design of Learning Model Dick & Carey



D. Trial Test Product

Trial test product is means use collecting data and that can be used as a basic for establisheing the level of valid, the effectiveness and attractiveness of the resluting of product. Some of the activities carried out in research trials for this development includes:

1. Trial Design

In the education, such as product design teaching materials can be directly tested, validated and after revision. Early stage trials conducted with simulated the use of instructional materials. Once simulated, it can be tested on a limited group. Testing was conducted to obtain information on whether the new teaching material is more effective and efficient than the old teaching materials or other.[52] The level of validity and exciting textbook analysis results revealed through learning activities that test was carried out through several stages, namely:

a) Validation by expert content/material fiel of study
b) Validation by expert product design
c) Validation by learning experts
d) Individual trial
e) Small group trial, and
f) Field trials

In development, the developer may just pass and quit at the stage of individual tests, or continued and stopped until a small group of test phase,

[52] Sugiyono. *Metode Penelitian Pendidikan*. (Bandung: CV. ALFABETA, 2009), hlm. 414

or until the field test. It really depends on the urgency and the data required by the test. The stages are used for testing are as follows:

1) The first stage is the individual trials (one-one evaluation). Individual test is represented by 3 students with the following criteria:
   a) Including 4th grade who is still active on the SDN Turen 02
   b) The respondents from one-one evaluation consisting of 3 persons is determined based on the criteria that the respondents represent the characteristics of the target group are included in the category of smart, medium, less.
   c) Willingness of students as data acquisition in developing learning materials learning IPA through learning based outdoor learning.
2) The second stage is a small group trials *(small group evaluation).* Respondents in this trial was 6 students. Determination of randomized subjects representing each participant criteria included in the category *high, averaged and low.*
3) The third stage is a field trial *(field evaluation)* the attractiveness of the test consists of textbooks and testing products to determine the level of student understanding before and after using the textbook development results of field trials of respondents drawn from the students of the 4th grade.

2. Subject Research and Subject Test Objectives and Measures Testing Product Development.

Expert is a person with extensive knowledge or ability based on research, experience, or occupation and in a particular area of study. An expert can be believed, by virtue of credential, training, education, profession, publication or experience, to have special knowledge of a subject beyond that of the average person, sufficient that others may officially (and legally) rely upon the individual's opinion.

Research in this area attempts to understand the relation between expert knowledge and exceptional performance in terms of cognitive structures and processes. The fundamental research endeavor is to describe what it is that experts know and how they use their knowledge to achieve performance that most people assume requires extreme or extraordinary ability. Studies have investigated the factors that enable experts to be fast and accurate.[53]

According Marie-Line Germain (Germain, 2006) She defined a behavioral dimension in experts, in addition to the dimensions suggested by Swanson and Holton (2001). Her 16-item scale contains objective expertise items and subjective expertise items. Objective items were named Evidence-Based items. Subjective items (the remaining 11 items Expert relative to specific field, an experts component.:

[53] Germain, M. L. (2009). The impact of perceived administrators' expertise on subordinates' job satisfaction and turnover intention. Academy of Human Resource Development. Arlington, VA. February 18–22, 2009.

a. His person has knowledge specific to a field of work.
b. This person shows they have the education necessary to be an expert in the field.
c. This person has the qualifications required to be an expert in the field.
d. This person has been trained in their area of expertise.
e. This person is ambitious about their work in the company.
f. This person can assess whether a work-related situation is important or not.
g. This person is capable of improving themselves.
h. This person is charismatic.
i. This person can deduce things from work-related situations easily.
j. This person is intuitive in the job.
k. This person is able to judge what things are important in their job.
l. This person has the drive to become what they are capable of becoming in their field.
m. This person is self-assured.
n. This person has self-confidence.
o. This person is outgoing.[54]

Subject assesment in the development of natural science textbook about the structure and function of plant material this is a field of study,

[54] Germain, M. L. (2006). Development and preliminary validation of a psychometric measure of expertise: The Generalized Expertise Measure (GEM). Unpublished Doctoral Dissertation. Barry University, Florida.

expert product design, and expert learning and target user test subjects namely garede 4th in SDN Turen 02 is as follows:

1) Expret Content/Materials Science Field of Study

Expert content field development studies expert is an expert content in terms of science, namely the Mother Anggraeni, M.Sc IPA which controls the characteristics of the material in SD / MI particular material structure and function of plant 4th grade. The steps are performed in the stage expert review the contents of this field of study is as follows:

a) Going to expert content material science fields of study structure and function of plant parts.
b) Explain the process of development that has been done.
c) Provide the results of the product that has been developed.
d) Through the questionnaire and interview instruments are required to fill in relevant expert opinions or comments about the quality of the textbooks were developed in terms of content or material.

2) Media Expert of Produck

Expert media products designated as examiners textbook textbook science-based design of outdoor learning. Selection of media experts is a person who has a background Master (S2), Mr. Ahmad Abtokhi, M.Pd. Assigment is based on the following considerations:

a) Have a educational background master science of UNESA

b) As a professor of physics UIN Maulana Malik Ibrahim Malang.

c) Prepared as a media product development ester texbook for students of grade 4 thin the SDN Turen 02.

The stepr are performed in the stage of product design expert review is the textbook is as follows:

a) Came to design experts.

b) Explain the process of development that has been done.

c) Provide the results of the product that has been developed.

d) Through the questionnaire and interview instruments are required to fill in relevant expert opinions or comments about the quality of textbooks developed in terms of design.

3) Expert Learning or field of study

Learning experts who provide feedback and assessment of this textbook is a person who has a background miniman education degree (S1), ie, the father Ustanto Widarko S.Pd, a 4th grade science teacher who daily teach science in SDN Turen 02. Election experts learning is based on considerations that are concerned have had a lot of teaching experience. Learning experts to comment d and general advice on learning materials that exist in the textbook.

4) Subject Target Trial

The subjects of the target product development trials are students at SDN Turen 02 or users the product development of textbook based IPA outdoor learning. The targets are set as the

subject of product development trials are 4th grade students of SDN 02 Turen. Following is a step-by-step stages of product development trials textbook.

a) First stage is the individual trial *(one-one evaluation).*

The trial is represented by three students, the following considerations:

1) They are the 4th grade students of SDN Turen 02.
2) The respondent is determined based on the crieria that the respondent can represent characteristics of learners capable of good, moderate and capable. Furthermore as a developer evaluate the respondent it turn.

This test is intended to get feedback and comments about the attractiveness of the textbook contents. The steps to be taken in the individual trials, which:

a) Developer explains the meaning of the evaluation.
b) Developer delivered atextbook learning that have been developer and the instruments of assessment.
c) Developer noted comments and accumulate the results of students' responses and comments related to the textbook developed.

b) The second stage is to test small group *(small group evaluation).*

Respondents in small group trials is six students. Determination of the target subjects randomized trial that will represent the three criteria that enabled students good, medium and low. The steps of this trial include

1) Gather a small group od students and explain the purpose of the trial
2) Developers convey to students about the teaching materials have been developed that nd assessment instrument.
3) Developer noted the comments and accumulate the results of students' responses and comments related to the textbook developed.

c) Third stage is field trials *(field evaluation)*

Field trials of the respondents overall grade 4^{th}. As for the steps in a test run is as follows:

1) Determine the sample
2) Prepare the environment and infrastructure
3) Organises tests early (pre-test)
4) Implement learning activities
5) Conducting the test end (post-test)
6) Collect data using instruments that have been provided.

3. Kinds of Data

The type of data on the development of research, in the form of quantitative data and qualitative data [55]. Quantitative data in the form of information that is obtained by using a questionnaire and a test of learning achievement after using the product textbook-based science learning constructivism learning using outdoor models. Quantitative data were collected through questionnaires and tests are:

a. Assessment expert content, media experts and expert product textbook learning about textbook precision components.
b. Student assessment tests on the attractiveness of the textbook.
c. The test results of student learning outcomes after using the textbook development (post-test results)

While the qualitative form:

a. Information on science learning obtained through interviews with teachers of science in SDN Turen 02.
b. Input, feedback, and suggestions for improvements based on assessment results obtained through expert interviews / consultations with less content experts, learning experts and practitioners in the IPA SDN Turen 02.

4. Instrumen to Collecting Data

The instrument used to achieve a number of the expected data will be used as the data collection instrument that is a result of the interview, now

[55] Wahid Murni dan Nur Ali, *Penelitian Tindakan Kelas Pendidikan Agama dan Umum DARI Teori Menuju Disertai Contoh Hasil Penelitian (*Malang: UM Pres, 2008)

and the test result of the study[56] Questionnaire was used to collect data on the response and suggestions of subjects and subject matter expert validator test target, then next used the revision. While the interview guide used to complement data obtained through the questionnaire.

5. Data Analysisi Techniques

There are three data analysis techniques are used to process the data that is the result of development, learning content analysis, descriptive analysis and t test analysis.

a. Analysis of learning content

Content analysis done by grouping analysis to formulate learning objectives based on the IPA standart of competence and basic competence as well as rearranging the contents of learning organization is developed with outdoor-based learning. The results of this analysis then used as the basis for the development of material science textbook Structure and Function of Plant.

b. Descriptive Analysis

In the test phase, the data collected using a questionnaire assessment questionnaire enclosed and open assessment to give criticism, suggestions, feedback repair. Descriptive analysis was used to determine the level of accuracy, effectiveness, and attractiveness of the product or the results of the development of a science textbook material structure and function of plant parts 4th grade students of SDN Turen 02. As stated

[56] Fitratul Uyun, *op.cit.,*

in point 3, the data collected can be grouped with data types and grouped into two, namely quantitative data in the form of figures and qualitative data in the form of words or symbols.

Data were obtained and analyzed. Data analysis techniques in this study is to describe all the opinions, suggestions and feedback obtained from the sheet validator criticism and suggestions. Data from the questionnaire is dikuantitatifkan qualitative data using a Likert scale that berkriteria four levels, then analyzed by calculating the percentage score of the items on every answer and every question in the questionnaire.

To determine the percentage can be use the following formula as follows:[57]

$$P = \frac{\sum x}{\sum x_i} x\ 100$$

Information:

P = Feasibility

$\sum x$ = The answer of option totally

$\sum x_i$ = Total of the highest answer[58]

To be able to give meaning and decision making at the level of accuracy, effectiveness, attractivines use the criteria of the scale level of achievement as follows :

[57] Arikunto, *Dasar-dasar Evaluasi pendidikan* (Jakarta:Bumi Aksara,2003). Page.313

[58] Suharsimi Arikunto. 1999. *Dasar–Dasar Evaluasi Pendidikan (Edisi Revisi)*. Jakarta: Bumi Aksara, hlm. 112

Tabel 3.3. Validation Criteria of Learning Media.[59]

Percentage (%)	Qualification	Description
80-100%	Valid	Does not need revision
60-79%	Valid enough	Does not need revision
40-59%	Less Valid	Need revision
0-39%	Invalid	Need revision

If the full validation score is at least 65, so media which developed can be utilized as a learning media in a school activity.[60]

c. Test Data Analysis

Data analysis teh results of test used to measure student learning outcomes comparison level. In the field trial test data using design of experiments carried out by means of membandigkan state before and after using the product development (before after). The use of design of experiments (before after) intended for product development as remedial material. The experimental design before after following

Tabel 3.4. Semu experimental research design *(quasy – experimental design)*

Group	Pretest	Treatment	Post test
Experimen	O_1	X_1	O_2
Control	O_3	X_2	O_4

[59] Sugiyono. 2008. Metode Penelitian Kuantitatif, Kualitatif, dan R&D. Bandung: CV. ALFABETA, hlm. 135

[60] *Ibid.*.

Information :

X_1 = Learning using books and media lab

X_2 = Learning without te use of books and media lab

O_1 & O_3 = first value/ pretest

O_2 & O_4 = final test/ post test

In field trials the data collected using questionnaires and achievement tests or achievement tests (test achievement of learning outcomes). Data collected by field trials using the initial test (pre-test) and final test (post-test) in order to compare the results of a field trial study group the 4th grade students before using the product after using the product development and development of teaching materials. To calculate the ratio using the formula mean (average) and reinforced by the formula t-test. The formula used in the t-test with a significance level at 0.05% is:[61]

1) Analysis average

Data collected by field trials using the initial test (pre-test) and final test (post-test) in order to determine the result of increased understanding of the subject or target of the comparison test that 4th grade students before and after using the product development textbook. Analysis techniques to determine the mean post-test and pre-test mean by the following formula:[62]

[61] Subana dkk, *Statistik Pendidikan* (Bandung: Pustaka Setia, 2005), page. 131-132

[62] Drs. H. Zen Amiruddin, M.SI. *Statistik Pendidikan,* (Yogyakarta: Teras: 2010), page.73

$$\text{Mean} = \frac{\sum x}{N}$$

information:

Mean = average

$\sum x$ = sum of value pre-test or post-test

N = sum of sampel

2) Analysis test T

Based on the results of the analysis of the mean (average) pretest and posttest the data further strengthened by t-test analysis. Techniques used in data analysis Dependent Test Sample. Criteria test is a test on Dependent Sample T Test.

The formula that is used with a significance level of 0.05% is :

$$t = \frac{D}{\sqrt{\frac{d^2}{N\,(N-1)}}}$$

Information[63] :

t : Test-t

D : Diferrent (X2-X1)

d^2 : Variation

N : sum of Sampel

[63]Akdon. 2007. *Modul Aplikasi Statistika Dalam Pendidikan*. Program Magister Pendidikan Dasar Sekolah Pascasarjana : Universitas Pendidikan Indonesia, page. 146

CHAPTER IV

RESEARCH AND DEVELOPMENT RESULT

In this chapter will explain data which to be the results development the 3 things related to research data, including 1) description of the material science, 2) representation of data validation, 3) revision of product development. The data collected is presented sequentially based on inputs from the expert content, media expert, expert learning IPA, and field trials.

A. Description of the material with model *Outdoor Learning*

The development of learning materials that have been created by the developer of the book of the student with subject of avtivity the structure and function of plant parts based on constructivism learning model with outdoor learning for the 4th grade in SDN Turen 02.

The teaching materials can be reviewed through the 4 aspects of the pre-preliminary, introduction, content, and supplementary parts. Following exposure to product description:

1. The pre-introduction

The pre-introduction of return describe the following learning materials develoment as follows:

a. Front and back cover

The front page (cover) drwan up as attractive as possible, so that readers have a desire and interest to know them. The front cover consist of developer name (Latifatus Sholikha), the title of book "*structure and function of plant parts",* for whom the books *(for SD/MI class 4th),* image support and in accordance with the material and constituent agencies. The back cover was designed more simply, contains a picture of the book developers, and development of textbook history .

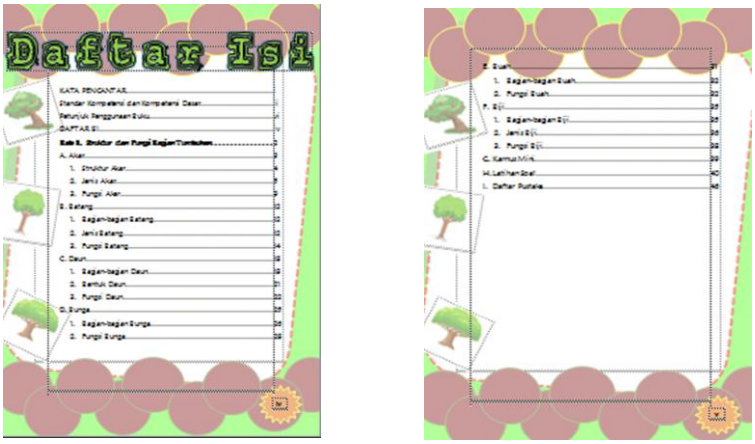
Gb. 4.1 Cover the development of book looks a head and back

b. Preface

The preface contains a series of sentences on a general description of the constituent content of textbooks, textbook authors expectations, thanks to all those who are able to assist the development of science textbooks, and query suggestion and criticism of the drafters to all readers to enhance textbook developed.

c. Table of contens

Table of contents, list of all the pages in the materials.



Gb. 4.2 Table of content

d. Standar of competence

Standart of competence and basic competence is taken from gonverment regulation No. 22 on standart content for he units of primary and secondary education especially the SK,KD for SD/MI.

Gb. 4.3 SK, KD, and indicator

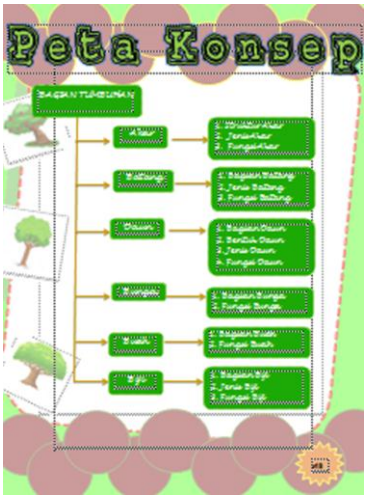
e. Guidance for teachers and students

Instructions for the teachers shows the stages that must be exercised in the use of the materials teeachers in the learning process. While the instructions for students contains stage learning acyivities and learning materials the materials structure and function of plant parts.

Gb. 4.4 The instructions book for teachers and students

f. Concept map

Concept map is a diagram drawn up to show a person understanding about the concept or idea. Map of this kind have a tiered structure, is impersonal from heading a special, furnished with the connecting lines as appropriated.



Gb. 4.5 concept of map

2. Parts introduction

The introduction is located at the beginning of the learning activities and aims to provide information related to the material to be learned and learning objectives to be achieved. The introduction consists as follows:

a. Title of chapter

The chapter headings listed to find out the discussion material will be studied.

b. The opening chapter pictures

The opening chapter, contains image of pictures representing the material learned at the chapter.

c. Learning objectives

Learning objectives based in the existing indicators. On the learning objectives at least must be ABCD, as follows:

1) *Audience* mean there should be students.
2) *Behaviour* it menas the ability to be achieved by students.
3) *Condition* menas the student activities/conditions of students who are learning.
4) *Degree (criterion)* criterion menas that the student will be achieved.

3. Part of content

The parts of consist of three studies, which are as follows:

a. Introductory text

Introductory text, ushering students into the material that will be discussed.

b. Pictures and illustrations

Images and illustrations, is presented to help understanding the material being studied. Illustrations are drawn based on the events surrounding the students so that students have a clear picture of the issues discussed.

c. Learning Materials

In the learning material structure function dn Plant section is adapted to map existing concepts. Discussion translated into several sub material, namely: roots, stems, leaves, flowers, fruits, and seeds. The material is presented in a systematic learning the language that is easily understood by elementary school children.

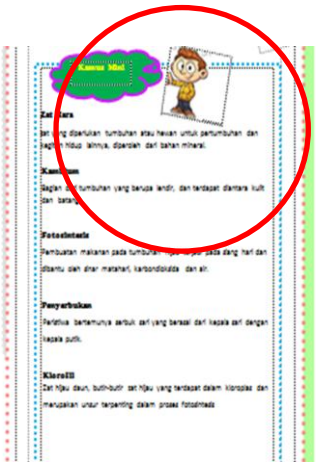
d. Activities

In the activity, task or cativity of which consist of practical work undertaken to better understand the material being studied. There are three sections in the activities, which are: 1) the tools and materials used teaching, 2) way of working that is the sequence of steps that should be followed by students, and 3) contains questions about questions related to practical work, and could also serve as practical results conclucion.

4. Support section

a. Dictionary (mini)

Present a difficult words with regard to material that was studied and equipped description.



Gb. 4.6 Dictionary mini

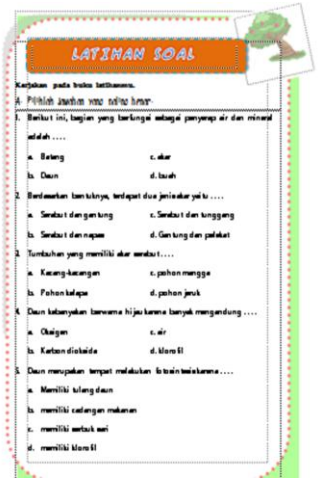
b. “Apa Kamu Tahu”

Gb. 4.7 Column do you know

“Apa Kamu Tahu” presents information related to the material presented in short and simple. The purpose of this component to arrange the students have more knowledge of the given material.

c. Exercise of problem

It contains exercises reserved which can be used to test the student understanding in addition, evaluation quetions drawn from the problems of UASBN.



Gb. 4.8 Exercise of problem

d. Bibliography

Contains a reference source that is taken by the author from a variety of sources, as the ampilifier and as a proof that the materials have a rationale.

Gb. 4.9 Bibliography

B. Presentation of Data Validation product Improved Matrials

Validation against the validator teaching materials that do experts was held on December 12, 2013 until December 21, 2013. Research data product development textbook conducted in four stages. The first is obtained from the results of an assessment of the product development of teaching materials made by the faculty of science and mathematics as the science of matter expert, the second stage is obtained from the results of an assessment of product development textbooks conducted by a lecturer of physics as a media expert, the third phase is obtained of an assessment of the product development onducted by the subject teacher and the fourth

stage obtained from the results of the validation of the product development textbook conducted in field trials drawn at random (2 repoden). The identity of the subject of the expert validation and field trials can be seen in appendix.

The data obtained is quantitative and qualitative data. Quantitative data derived from assessment questionnaire with Likert scale, while the qualitative data obtained from a validator additional assessment or advice. The data were analyzed using the results of the validation techniques the average value calculation at each assessment item. For expert validator questionnaire and students scoring criteria values are as follows:

Table 4.1 Criteria Scoring question form Validation expert, teacher and students study areas

Answer	Information	Scor
VR	Very Relevant	5
R	Relevant	4
ER	Enough Relevan	3
LR	Less Relevan	2
IR	Invalid Relevan	1

Here is the submission of data and data analysis by expert assessment questionnaire material, media experts and 4th grade teacher at Elementary School Turen 02 along with criticism and advice.

1. The results of the Validation Material Experts

a) Quantitative Data

Table 4.2
Quantitative Data results validation expert material

No.	The Questions	*X*	x_i	P (%)	The level of Validity	Information
1.	What about the degree of relevance to the curriculum guide in effect	5	5	100	Very Valid	No Revision
2.	How precision writing titles and chapter headings of each unit in the guide books	4	5	80	Valid	No Revision
3.	What about the language used in the manual	4	5	80	Valid	No Revision
4.	How easy to undertstand language in the book	4	5	80	Valid	No Revision
5.	Is the concept maps to help determine the content of guidebooks	5	5	100	Very Valid	No Revision
6.	What about the addition of the chapter on the scientific method guidebook	4	5	80	Valid	No Revision

7.	How does the accuracy of the learning objectives at the beginning of each chapter	5	5	100	Very Valid	No Revision
8.	How suitability types and forms of evaluation in 5 books guide	5	5	100	Very Valid	No Revision
9.	How writing tool materials and steps - each step experiments on existing trials on a guide book	5	5	100	Very Valid	No Revision
10.	What about the accuracy of the conclusions giving columns at each end of the experimental session	4	5	80	Valid	No Revision
11.	Is the book component was sufficient as a practical guide book?	4	5	80	Valid	No Revision
12.	How breadth and depth of the content of teaching materials	4	5	80	Valid	No Revision
13.	How does the order	5	5	100	Very Valid	No Revision

	of presentation of the material					
14.	How consistent format instructional materials	4	5	80	Valid	No Revision
15.	How to understand the material description	5	5	100	Very Valid	No Revision
Total		**67**	**75**	**90%**	**Valid**	**No Revision**

$$P = \frac{\sum x}{\sum x_i} x\ 100\%$$

Information:

P : percentage level of validity

x : answer scores by validator, she is Mrs. Dewi Anggraeni, M.Sc as a content expert of natural science

x_i : highest answer scores

Based on the above calculation, the observations made by the whole matter experts reached 90%. If the eligibility criteria are matched with the table, then the score is included in the valid criteria.

b) Qualitative Data

Qualitative data results matter experts can be seen in table

Table 4.3 Critical and Suggestion from content expert

Subject name of test expert	Critical and suggestions
Dewi Anggraeni, M.Sc	1. Fix a concept map with the phrase and the correct explanation. 2. Providing n explanation of the image. 3. Depth material tailored to the students level of thingking. 4. Article in the nstructional materials to be studied further beacuse there are some wrong.

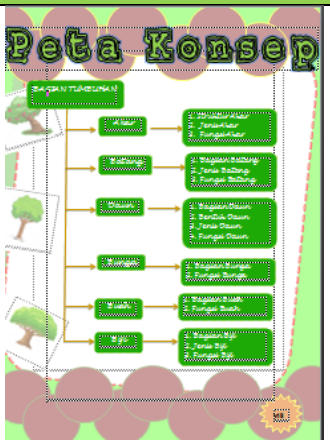
According to the table above criticism and suggestions, it appears that there are several points that need to be corrected to improve products including textbooks; improvement concept maps with real explanation, explanations on image repair, fix typing the wrong posts, images also need to be copied again to increase the students understanding related to the material being studied. In general, the material is good according to experts.

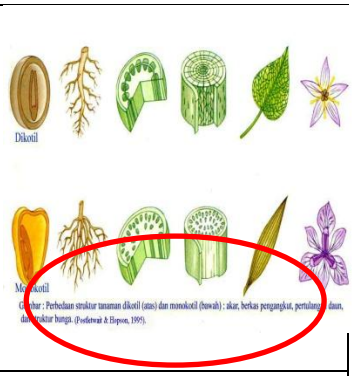
C. Revision Product of development

Based on the analysis conducted, the revision of the following books and media:

Table 4.4

Revision of the textbook based on Validation from Expert

No	Point revised	Before Revised	After Revised
1	Perbaiki on the concept map and explanation of the correct sentence		
2	Giving Illustration on the introductio n		

3	Giving explanations on image.		
4	Posts in teaching materials to be studied again because there were some wrong	Stems can be thought of as the supporting body of the plant. This section generally grow above ground. Direction opposite to the stem of the plant grows gravity, this means the plant stems grow toward the direction of the sun. Generally branched stems on certain plants.	Stems can be thought of as the supporting body of the plant. This section generally grow above ground. Direction plant stems grow toward sunlight. This proves that the stem of the plant growth requires sunlight. Generally branched stems on certain plants.

All data results of the review, assessment and discussion with expert knowledge of natural materials used as a basis for revising textbooks to menyempurnaan components and materials science subjects before tested on users teach learners product development.

2. Result Validation Expert Media

a) Quantitatif Data

Quantitative data validation results matter experts can be seen in table 4.5

Table 4.5
The Results of the Media Expert Validation Maetrials Based on Natural Science

No.	Questions	X	x_i	P (%)	Scala Conversion	Information
1.	How attractiveness of the packaging design of the cover in the textbook	4	5	80	Valid	No Revision
2.	What about the suitability of an image on the cover in the textbook	4	5	80	Valid	No Revision
3.	What about the suitability of the selection of chapter titles and opening shots chapters in textbooks	5	5	100	Very Valid	No Revision
4.	What about the attractiveness of the concept map in the textbook	5	5	80	Valid	No Revision
5.	What about the suitability of the use of fonts used in cover in the	4	5	80	Valid	No Revision

	textbook					
6.	What about the accuracy of the layout settings	4	5	80	Valid	No Revision
7.	What about the consistency of the use of space, title, and typing the material?	4	5	80	Valid	No Revision
8.	How precision placement of images on each sub-chapter in the textbook	4	5	80	Valid	No Revision
9.	What about the suitability of the use of varied types, sizes and shapes of letters for section title	4	5	80	Valid	No Revision
10.	How suitability variasai use types, and form letters for the title of each experiment	5	5	100	Very Valid	No Revision
Total		**43**	**50**	**86%**	**Valid**	**No Revision**

$$P = \frac{\sum x}{\sum x_i} \times 100\%$$

Information:

P : percentage level of validity

x : answer scores by validator, by Mr. Ahmad Abthoki, M.Pd as a content expert of natural science

x_i : highest answer score

Based on the above calculation, the observations made by the whole matter experts reached 86%. If the eligibility criteria are matched with the table, then the score is included in the valid criteria.

b) Qualitative Data

Qualitative data validation results of design experts and the media can be seen in Table 4.6

Table 4.6
Critical and Suggestion from Social Science Teacher about the material science

Subject name of test expert	Critical and Suggestion
Ahmad Abthoki, M.Pd	1. Content preface replaced. 2. Clarified cover image. 3. Use one full sheet to sheet activities. 4. Drawing whenever possible use collection personal. 5. Change color of learning objectives. 6. Replace the back of cover.

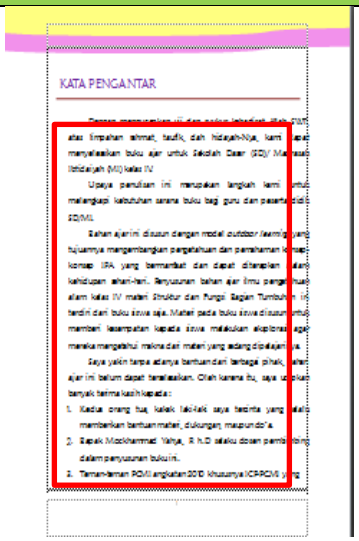
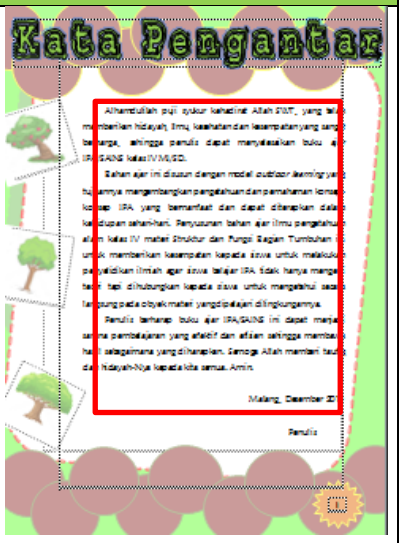
According to the table above criticism and suggestions, it appears that there are several points that need to be corrected to improve products including textbooks; the content of the foreword is replaced, use the

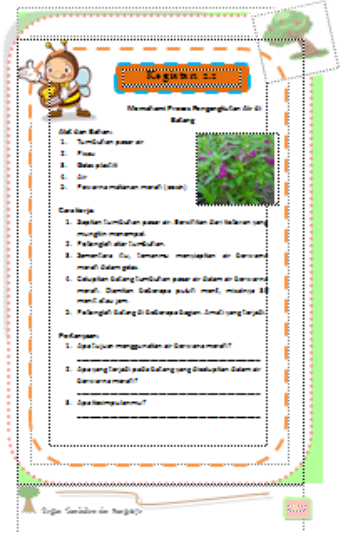
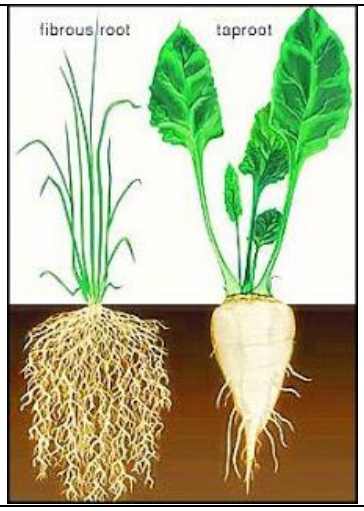
cover image clearer, use 1 sheet for student activities, using image-image around private collections, providing a more attractive color on learning objectives, and also replace the back cover to avoid monoton.

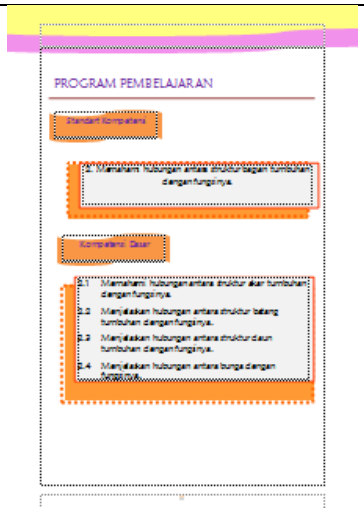
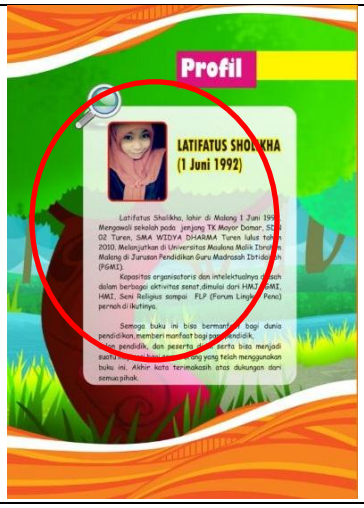
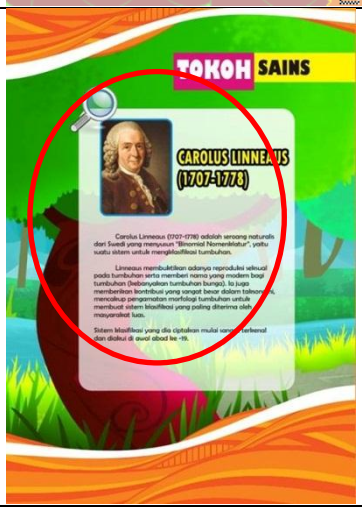
c) Revision of Product

Based on the analysis conducted, the revision of the following books and media.

Table 4.7
Revision book based validation expret media science

No	Point that Revised	Before Revised	After Revised
1	Contents preface replaced		

2	Cover images and writings clarified		
3	Use 1 sheet full of activity sheets.		
4	The images as much as possible using a personal collection		

5	The color of the modified learning program.		
6	Replacing the back cover is more appropriate		

All data result from the review, assessment and discussions with experts textbook learning media used as a basis for revising the design for improving science textbooks before students tested on users textbook product development

3. Validation of Natural Science Teacher

a) Quantitative Data

Quantitative data on the results of the validation study expert teachers of science can be seen in table 4.8

Table 4.8
Validation Result of Natural Science Teacher

No.	Components	*X*	x_i	P (%)	Scala Conversion	Information
1.	The formulation of a topic on the development of science textbooks is clear, specific, and operational	4	4	100	Very Valid	No Revision
2.	The material presented on the development of this science textbooks appropriate	3	4	75	Enough Valid	No Revision
3.	The formulation of the indicators presented in the book that the teacher in accordance with the formulation of basic competencies specified in SBC 2006.	4	4	100	Very Valid	No Revision
4.	Competency standards with indicators on the development of the relevant science textbooks	4	4	100	Very Valid	No Revision

5.	Fill in your textbook learning in accordance with SBC 2006	4	4	100	Very Valid	No Revision
6.	Describing the content of learning in the science textbooks systematically	4	4	100	Very Valid	No Revision
7.	The scope of the material presented in this science textbook in accordance with the theme	4	4	100	Very Valid	No Revision
8.	The essence of learning is designed to focus on students	4	4	100	Very Valid	No Revision
9.	The essence of learning is designed to give students the opportunity to work together with friends or interacting with the environment	4	4	100	Very Valid	No Revision
10.	The material is presented through science teaching materials can motivate students to study harder	4	4	100	Very Valid	No Revision

11	The level of difficulty of the language used in accordance with the level of student understanding.	4	4	100	Very Valid	No Revision
12	Evaluation instrument used to measure the ability of students	4	4	100	Very Valid	No Revision
13	Lesson plan that is made in the student activity book is easy to apply	4	4	100	Very Valid	No Revision
Total		**51**	**52**	**98%**	**Very Valid**	**No Revision**

$$P = \frac{\sum x}{\sum x_i} x\ 100\%$$

Information:

P : persentase level of validity

X : answer score by validator, Mr Ustanto Widarko, S.Pd as a teacher od natural science.

x_i : Highest answer scores.

Based on the above calculation, the observations made by the whole matter experts reached 98%. If the eligibility criteria are matched with the table, then the score is included in the valid criteria.

b) Qualitative Data

Qualitative data validation results of design experts and the media can be seen in Table 4.9

Table 4.9
Critical and Suggestion from Natural Science Teacher about the books material

Subject name of test expret	Critical and Suggestion
Ustanto Widarko S.Pd	1. The books is good and nice 2. Detailed introduction 3. At the end of the activity, for example the students worksheet included 2.1

According to the table above criticism and suggestions, it appears that there are some words that should be justified because there is an error in typing. In general, student activity book is good according to teachers of science in elementary / MI.

c) Product Revision

Based on the results of the assessment test subject teachers teaching the instructional materials do not need to get a product development revisions or improvements. However, and comments and suggestions from respondents on the test subject teachers of natural sciences in the open-ended questions will be considered for the improvement of the development of teaching materials so that the resulting product will be better.

4. Trial Result 4th grade science textbook based constructism learning with outdoor model

Validation of the data obtained from the test results of the teaching materials on 4th grade students of SDN 02 Turen performed during 2 meetings began on December 3, 2013. Products tested in the field of development in the form of teaching materials, which will be testing these products through three stages including ; 1) individual trials (one-on-one) is represented by three students who have the skill level criteria "smart" good, moderate, and less; 2) a small test group (small group evaluation) were performed by all fourth grade students of SDN 02 Turen Malang. Following exposure to the test result data:

a. Individual Trial *(One-on-One)*

1) Qualitative Data

Exposure to quantitative data from individual test results are presented in Table 4.10 as follows:

Tabel 4.10
Data Assesment Materials Grade 4th

No	Questions	Respondent			$\sum x$	$\sum xi$	P (%)	Validation Criteria	Information
		1	2	3					
1.	Textbook of physical appearance by using a model-based constructivism nice and attractive outdoor learning	3	4	3	10	12	83	Valid	Not Revision
2	The use of science textbooks can encourage learning	4	3	4	11	12	92	Valid	Not Revision
3	Science textbooks allows students to understand the lesson material	4	4	4	12	12	100	Valid	Not Revision
4	The questions in the science textbooks easily	3	3	4	10	12	83	Valid	Not Revision
5	The font and font size contained in the textbook IPA facilitate students in reading	4	4	4	4	12	100	Valid	Not Revision
6	The words are used according to the situation of students	3	3	3	9	12	75	Valid	Not Revision
7	Clear and attractive illustrations in accordance with the material	4	4	3	11	12	92	Valid	Not Revision
8	Language and instructions are easy to understand science textbooks	4	4	4	12	12	100	Valid	No Revision
9	Exercises are easy to understand	3	3	4	10	12	83	Valid	No Revision

10	This instructional materials to help students to work together with friends and the environment	4	4	4	12	12	100	Valid	No Revision
Total		**36**	**36**	**37**	**109**	**120**	**91%**	**Valid**	**No Revision**

Information:

1. Responden 1 is a student in 4th grade at SDN Turen 02 named Hivni Ardiansyah
2. Responden 1 is a student in 4th grade at SDN Turen 02 named Elvara Adelia. F.M
3. Responden 1 is a student in 4th grade at SDN Turen 02 named Fani Yusofa

2) Analisys Data

Quantitative data obtained from individual trials in the table, the next step of data analysis. Here is the percentage of the level of achievement of individual trials teaching materials:

$$P = \frac{\sum x}{\sum x_i} x\ 100\%$$

Information:

P : Percetage of validation rate

x : scor total of evaluator answer (real value)

x_i : the highest answer score

Because of the weight of each option is one, then the percentage of individual test results was 91%. Once converted to the scale conversion

table 4, the level of achievement of 91% on qualifying bearada invalid so that teaching materials need not be revised.

Criticism and suggestions from respondents on individual trials in question through a questionnaire, received and taken into consideration to enhance teaching materials.

b. Small group trial *(Small Group Evaluation)*

1) Quantitative Data

Following exposure to the quantitative data of small groups of test results in the table 4:11

Tabel 4.11 Research results trial in small group

No	Questions	Respondent						$\sum x$	$\sum xi$	P (%)	Validity Rate	Information
		1	2	3	4	5	6					
1	Physical appearance-based science textbooks constructivism by using the model of good and interesting outdoor learning	4	4	4	4	4	4	24	24	100	Valid	No Revision
2	The use of science textbooks can encourage learning	4	4	4	4	4	4	24	24	100	Valid	No Revision
3	Instructional materials science lesson allows students to understand the material	4	4	4	4	4	4	24	24	100	Valid	No Revision
4	The questions in natural science instructional materials easy.	4	4	4	4	4	4	24	24	100	Valid	No Revision
5	The font and font size easy to read students	4	4	4	4	4	4	24	24	100	Valid	No Revision
6	The words are used according to the situation of students	4	4	4	4	4	4	24	24	100	Valid	No Revision

7	Clear and attractive illustrations in accordance with the material	4	4	4	4	4	4	24	24	100	Valid	No Revision
8	Language and instructions are easy to understand science textbooks	4	4	4	4	4	4	24	24	100	Valid	No Revision
9	Exercises are easy to understand	4	4	4	4	4	4	24	24	100	Valid	No Revision
10	This textbook helps students to work together with friends and the environment	2	4	4	3	4	4	21	24	87,5	Valid	No Revision
Total		**38**	**40**	**40**	**37**	**39**	**40**	**234**	**240**	**97,5%**	**Valid**	No Revision

Information:

1. Responden 1 is a student in 4th grade at SDN Turen 02 named Fani Yusof
2. Responden 1 is a student in 4th grade at SDN Turen 02 named Sabrina
3. Responden 1 is a student in 4th grade at SDN Turen 02 named Hana Aziza
4. Responden 1 is a student in 4th grade at SDN Turen 02 named Elvara Adelia.
5. Responden 1 is a student in 4th grade at SDN Turen 02 named Hivni Ardiansyah
6. Responden 1 is a student in 4th grade at SDN Turen 02 named Mir'atul Ulya.

2) Analisis Data

Quantitative data obtained from a small pilot group in Table 4:11 the next step of data analysis. Here is the percentage of the level of achievement of individual trials of teaching materials:

$$P = \frac{\sum x}{\sum x_i} x\ 100\%$$

Information:

P : Percentage of validation rate

x : score total of evaluator answer (real value)

x_i : the highest answer score

Percentage of the results of individual trials was 97.5%. Once converted to the scale conversion tebel 4, the level of achievement of 97.5% at the qualification is valid so that teaching materials do not need to be revised, criticism and suggestions from respondents on a small test group in question through a questionnaire, received and taken into consideration to enhance teaching materials.

c. Field Trial Test *(field evaluation)*

1) Quantitative Data

Exposure to quantitative data from a field trial results are as described in the following table 4:12

Table 4.12
Field Trial Research Results Of Materials Science Textbook Structure and Function of Plant Parts

No.	Question	Score are given by respondents 1,2,3,4,5,6,7,8,9,10,11,12, 13,14,15,16,17,18,19,20,21,22,23,24, 25,26,27,28	$\sum x$	$\sum xi$	P (%)	Validity Criteria	Information
1.	Physical appearance-based science textbooks constructivism by using the model of good and interesting outdoor learning	4,4,4,4,4,4,4,4,4,4,4,4,4,4, 4,4,4,4,4,4,4,4,4,4,4,4,4,4	112	112	100	Valid	No Revision
2	The use of science textbooks can encourage learning	4,4,4,4,4,4,4,4,4,4,4,4,4,4, 4,4,4,4,4,4,4,4,4,4,4,4,4,4	112	112	100	Valid	No Revision
3	Science textbook allows students to understand the lesson material.	4,4,4,4,4,4,4,4,4,4,4,4,4,4, 4,4,4,4,4,4,4,4,4,4,4,4,4,4	112	112	100	Valid	No Revision

4	The questions in natural science textbooks easily	4,4,4,4,4,4,4,4,4,4,4,4,4,4,4,4,4,4,4,4,4,4,4,4,4,4,4,4,4,4,4	112	112	100	Valid	No Revision
5	The font and font size contained in natural science textbook facilitate students in reading	4,4,4,4,4,4,4,4,4,4,4,4,4,4,4,4,4,4,4,4,4,4,4,4,4,4,4,4,4,4,4	112	112	100	Valid	No Revision
6	The words are used according to the situation of students	4,4,4,4,4,4,4,4,4,4,4,4,4,4,4,4,4,1,4,4,4,4,4,1,4,4,4,4	103	112	92	Valid	No Revision
7	Clear and attractive illustrations in accordance with the material	4,4,4,4,4,4,4,4,4,4,4,4,4,4,4,4,4,4,4,4,4,4,4,4,4,4,4,4,4,4,4	112	112	100	Valid	No Revision
8	Language and instructions are easy to understand science textbooks	4,4,4,4,4,4,4,4,4,4,4,4,4,4,4,4,4,4,4,4,4,4,4,4,4,4,4,4,4,4,4	112	112	100	Valid	No Revision
9	Exercises are easy to understand	4,4,4,4,4,4,4,4,4,4,4,4,4,4,4,4,4,4,4,4,4,4,4,4,4,4,4,4,4,4,4	112	112	100	Valid	No Revision
10	This textbook helps students to work together with friends and the environment	2,4,4,2,4,2,3,4,3,3,3,3,3,3,3,3,3,4,3,4, 4,3,3,3,3,4,4,3,3	90	112	100	Valid	No Revision
Total			**1089**	**1120**	**97,2%**	**Very Valid**	**No Revision**

Information:

1. Responden 1 is a student in 4th grade at SDN Turen 02 named Anton Hadi Saputro
2. Responden 1 is a student in 4th grade at SDN Turen 02 named Fitra Wahyu Amalia
3. Responden 1 is a student in 4th grade at SDN Turen 02 named Luky Ayu Dinata
4. Responden 1 is a student in 4th grade at SDN Turen 02 named Trio Ardito
5. Responden 1 is a student in 4th grade at SDN Turen 02 named Firmansyah Saputra
6. Responden 1 is a student in 4th grade at SDN Turen 02 named Ardian Septiawan
7. Responden 1 is a student in 4th grade at SDN Turen 02 named Fani Yusafa
8. Responden 1 is a student in 4th grade at SDN Turen 02 named Hifni Ardiansyah
9. Responden 1 is a student in 4th grade at SDN Turen 02 named M. Feri Ardiansyah
10. Responden 1 is a student in 4th grade at SDN Turen 02 named Hana Nur Azizah
11. Responden 1 is a student in 4th grade at SDN Turen 02 named M. Bagus Saputra

12. Responden 1 is a student in 4th grade at SDN Turen 02 named Yuli Ismiawati
13. Responden 1 is a student in 4th grade at SDN Turen 02 named Anita Nuryana
14. Responden 1 is a student in 4th grade at SDN Turen 02 named Aulia Shihitiantins
15. Responden 1 is a student in 4th grade at SDN Turen 02 named Alfin Ramadhani P
16. Responden 1 is a student in 4th grade at SDN Turen 02 named Dina Ebi Pratiwi
17. Responden 1 is a student in 4th grade at SDN Turen 02 named Gween Rahma Sella
18. Responden 1 is a student in 4th grade at SDN Turen 02 named Ilyas Maulana Hidayat
19. Responden 1 is a student in 4th grade at SDN Turen 02 named Mir'atul Ulya
20. Responden 1 is a student in 4th grade at SDN Turen 02 named Popy Dwi Wulandari
21. Responden 1 is a student in 4th grade at SDN Turen 02 named Nur Aini
22. Responden 1 is a student in 4th grade at SDN Turen 02 named Ramadan Novan H
23. Responden 1 is a student in 4th grade at SDN Turen 02 named Sabrina Anggelika

24. Responden 1 is a student in 4th grade at SDN Turen 02 named Yolanda Putri Aulia
25. Responden 1 is a student in 4th grade at SDN Turen 02 named Akmal Sabitul M
26. Responden 1 is a student in 4th grade at SDN Turen 02 named Bagas Pratama
27. Responden 1 is a student in 4th grade at SDN Turen 02 named Dela Anissa
28. Responden 1 is a student in 4th grade at SDN Turen 02 named Elvara Adelia Febriana M

2) Analisys Data

Quantitative data obtained from a small pilot group in Table 4.12 the next step of data analysis. Here is the percentage of the level of achievement of individual trials teaching materials:

$$P = \frac{\sum x}{\sum x_i} x\ 100\%$$

Information:

P : percentage of validation rate
x : score total of evaluator answer (real value)
x_i : the highest answer score

Because the weight of each option is 1, then the percentage = 97.2%. Once converted to the conversion table skla 4, porsentase 97.2% achievement rate is at a valid qualification that this text does not need to be revised.

Comments and suggestions from respondents on trial in a small group of open questions, accepted and taken into consideration to enhance textbook.

D. Result Data Analysis of Pre-Test and Post-Test

Following the presentation of the data obtained pretest and posttest of fourth grade students in the field tests are presented in Table 4:13, below:

Table 4.13 Respondent the Field Trial Assesment Pre-Test and Post-Test

No	Name of Respondent	Value	
		Pre-Test	Post-Test
1	Anton Hadi Saputro	65	80
2	Fitra Wahyu Amalia	50	75
3	Luky Ayu Dinata	65	80
4	Trio Ardito	60	80
5	Firmansyah Putra	85	100
6	Damai Lintang A	85	95
7	Fani Yusafa	50	85
8	Hivni Ardiansyah	80	85
9	M. Feri Ardiansyah	45	75
10	Hana Nur Azizah	85	95
11	M. Bagus Saputra	55	80
12	Yuli Ismiawati	80	95
13	Anita Nuryana	70	85
14	Aulia S. Sholihah	50	70
15	Alfin Ramadhani P	40	80
16	Dina Ebi Pratiwi	85	95
17	Gween Rahma Sella	45	85
18	Ilyas Maulana Hidayat	75	95
19	Mir'atul Ulya	90	100
20	Popy Dwi Ramadhani	60	80
21	Risa Nur Aini	40	75
22	Ramadhan Novan H	70	95
23	Sabrina Anggelika	85	95
24	Yolanda Putri Aulia	75	80
25	Akmal Sabitul M	60	75
26	Bagas Pratama	65	85
27	Dela Annisa	85	95
28	Elvara Adelia Febriana M	60	85
Total		**66,42**	**85,7**

The table above, it can be seen by finding the average results of the pre-test and post-test with the formula:

$$\text{Mean} = \frac{\sum x}{N}$$

Information:

Mean : average

$\sum x$: the amount of the value of pre-test and post-test

N : total of sample

Based on the average calculation using the above formula shows that the average value of the pre-test was 66 and the average value or mean post-test that is 85.7 larger than the value of the pre-test which tend to be smaller that 66, signify that there is a significant understanding as much as 24.5. Students can be increase in value / learning outcomes after the use of products based constructivist science teaching materials using the outdoor learning models, so it can be said that the book effectively improve the understanding of science in science teaching 4^{th} grade.

Data values pretest and post-test were then analyzed by two-sample t test (Paid Sample T-Test). This analysis technique is used to determine whether there is an influence on the treatment given to the object of research groups. Indicator of whether there is influence from this study that if there is a difference between understanding the cognitive students performed before and after the use of teaching materials developed.

Based on existing data, it will be carried out calculations related to the teaching materials developed can enhance cognitive understanding whether or not the student. Here are the steps calculations using t-test formula:

Step 1; make Ha and Ho in the form of sentences

Ha: There are differences between the students' cognitive understanding before and after the use of instructional materials science materials structure and function of plant parts by using a model-based constructivism outdoor learning

Ho: There were no differences between the students' cognitive understanding before and after use the instructional materials science materials structure and function of plant parts by using a model-based constructivism outdoor learning.

Step 2; search T_{count} by the following formula follows us:

$$t = \frac{D}{\sqrt{\frac{d^2}{N\,(N-1)}}} \text{ and db} = N\text{-}1 = 28\text{-}1$$

Step 3; determine the t-test criterion.

a. If the value t_{count} more less than t_{table} significant meaning then Ho is accepted and Ha is rejected.
b. If the value t_{count} more less than t_{table} significant meaning then Ho is rejected and Ha is accepted.

Step 4; determine the statistical results of the pretest and posttest with the t-test formula.

Table 4.14 Field Trial Assessment pretest and posttest with the t-test formula

No	Name	Value		D (X_2-X_1)	d^2
		Pre-Test (x_1)	Post-Test (x_2)		
1	Anton Hadi Saputro	65	80	15	225
2	Fitra Wahyu Amalia	50	75	25	625
3	Luky Ayu Dinata	65	80	15	225
4	Trio Ardito	60	80	20	400
5	Firmansyah Putra	85	100	15	225
6	Damai Lintang A	85	95	10	100
7	Fani Yusafa	50	85	35	1225
8	Hivni Ardiansyah	80	85	5	25
9	M. Feri Ardiansyah	45	75	30	900
10	Hana Nur Azizah	85	95	10	100
11	M. Bagus Saputra	55	80	25	625
12	Yuli Ismiawati	80	95	15	225
13	Anita Nuryana	70	85	15	225
14	Aulia S. Sholihah	50	70	20	400
15	Alfin Ramadhani P	40	80	40	1600
16	Dina Ebi Pratiwi	85	95	10	100
17	Gween Rahma Sella	45	85	40	1600
18	Ilyas Maulana Hidayat	75	95	20	400
19	Mir'atul Ulya	90	100	10	100
20	Popy Dwi Ramadhani	60	80	20	400
21	Risa Nur Aini	40	75	35	1225
22	Ramadhan Novan H	70	95	25	625
23	Sabrina Anggelika	85	95	10	100
24	Yolanda Putri Aulia	75	80	5	25
25	Akmal Sabitul M	60	75	15	225
26	Bagas Pratama	65	85	20	400
27	Dela Annisa	85	95	10	100
28	Elvara Adelia Febriana	60	85	25	625
Total		**1860**	**2400**	**540**	**13050**

Here are the result of pretest and post-test with the t-test formula:

$$t = \frac{D}{\sqrt{\frac{d^2}{N\,(N-1)}}}$$

$$= \frac{19{,}28}{\sqrt{\frac{13050}{28\ (28-1)}}}$$

$$= \frac{19{,}28}{\sqrt{\frac{13050}{756}}}$$

$$= \frac{19{,}28}{\sqrt{17{,}26}}$$

$$= \frac{19{,}28}{4{,}154}$$

$$= 4{,}641$$

$$D = \frac{\sum D}{N}$$

$$= \frac{540}{28}$$

$$= 19{,}28$$

Information :

t : T-test
D : Different (x_2-x_1)
d^2 : Variance
N : Total of sample

Step 5 ;compare t_{count} and t_{table}

T_{count} = 4,641

T_{table} = 1,071

Step 6 ;conclusion

The calculations show that t = 4.641 and t table = 1.071. In conclusion then Ho is rejected and Ha accepted, so there are significant differences between the results of understanding before and after the use of instructional textbook science materials structure and function of plant.

CHAPTER V

DISCUSSION

In this chapter will be understanding and elaborated with discussion. The discussion in this development is divided four main ideas include: 1) Analysis of the development in teaching materials, 2) Revised product development of teaching materials, 3) analysis of the level of effectiveness, and teaching materials.

A. Analysis of the development in teaching materials

The discussion in this development is divided into four main ideas include: 1) Analysis of the development of teaching materials, 2) Revision of product development of teaching materials, 3) analysis of the level of effectiveness, keefensiensi, and the attractiveness of the teaching materials. 4) analysis of the influence of the development of teaching materials.

Constructivism-based learning with the use of outdoor learning models basically, not only to develop intellectual abilities alone but all this potential, including the emotional and skill development is a process that begins with formulating the problem, formulating a hypothesis, collecting data, analyzing data, and also make a conclusion.[64] This refers to the teaching materials assessment indicators of learning effectiveness and appeal. This textbook is

[64] Trianto, *Model-Model Pembelajaran Inovatif Berorientasi Konstruktivistik,* (Jakarta: Prestasi Pustaka, 2007), page. 137

expected to guide the students were able to think independently and creatively to the things that are needed during the learning process. This teaching material has advantages and disadvantages that still need improvement.

The advantages of a constructivist-based teaching materials science learning with outdoor model, with other teaching materials are as follows:

1. The teaching materials are designed based on the characteristics of students so that users can be used independently.
2. Teaching materials supporting the book is designed as a science teaching materials Plant Structure and Function Part curriculum KTSP in 2006, so it can be used for subsequent curriculum.
3. Material is accompanied by guidelines for teaching the use of the book making it easier for users of this book or the student in use.
4. The teaching materials is accompanied by the foundation of the Qur'an as well as the content and book materials, so that readers can understand the purpose of this science book.
5. Material each sub subject presented in the textbook is equipped with observation tasks (scientific inquiry) or activities students to construct knowledge independently.
6. Textbook is accompanied by active student activities that put more emphasis on outdoor learning process learning, these activities are presented in the form of group work and independent tasks, so that students can immediately know what to do with his own observations of students outside

the classroom. This is suitable because their world is a world of concrete operations that are difficult given the understanding in the abstract.

7. These textbooks contain questions that lead students to construct their own knowledge and understanding of the material presented through learning based on constructivism.
8. Completeness of teaching materials can also be seen with the addition of knowledge you know that contains in each sub-topic, it is intended that students can acquire more knowledge.
9. Textbook was developed, equipped with the evaluation chapters in reference books UASBN seconds in 2010/2011 to test the students' understanding.
10. During each disscusion in instructional materials are presented using images that support so that students interested in learning.
11. Through this textbook developed, guidance of teachers and students will be able to be controlled and the previous study focused on teachers (teacher center) is now turning into a (student center). In addition, learning can also take place interactively.

The shortage of teaching materials science materials structure and function of plant parts by using a model-based constructivism developed outdoor learning is confined to a discussion of the material that is only part of the structure and function of plant.

The results of the validation of some of the subject has been converted to a percentage based on the level skala of validity and revise guidelines for teaching materials developed with the level of attainment of the following:

Table. 5.1 Qualification Feasibility based on Percentage

Percentage (%)	Validity Criteria	Information
84-100	Very Valid	Does not need revision
68-84	Valid	Does not need revision
52-68	Valid enough	Just part of revision
36-52	Less Valid	Need revision
20-36	Invalid	Total revision

1. Analisys Data Validation of Expert book natural science

Based on the conversion scale specified in the product assessment questionnaire questionnaire, are as follows:

a. Score 1 for no clear, inappropriate, irrelevant, not systematic, not motivated, do not measure the ability.

b. Score 2 for the less obvious, less appropriate, less relevant, less systematic, less motivated, less measuring capability.

c. Score 3 for clear, appropriate, relevant, motivating, measuring ability.

d. Score 4 for a very clear, very appropriate, very relevant, very systematic, very motivated, very measured the ability.

Here are the results of the validation of data exposure matter experts on teaching materials science materials science structure and function of plant parts, are as follows:

a. The level of relevance to the curriculum teaching materials applicable percentage is obtained with 90% votes. This suggests that the relevance of teaching materials and the curriculum is apt.
b. Suitability of the material presented on the assessment of teaching materials obtained by the percentage of 100%. This suggests that the material contained in the instructional materials have been very appropriate for students.
c. Compliance with the standards of competence with a very appropriate indicator.
d. Suitability indicators presented is in accordance with basic competence.
e. Describing the content of learning in science textbooks systematically
f. Suitability systematics and systematic description of the learning content accordingly
g. The accuracy of the material presented can provide motivation to students is very motivating and relevant.
h. Conformity summary of the material with clear and systematic discussion.
i. The level of difficulty of the language used, quite in accordance with the level of student understanding.
j. Evaluation instrument used to measure the ability of students.

The data from the questionnaire responses were filled out by Mrs. Dewi Anggraeni, M.Sc as matter experts, can be calculated using the percentage level of validity of the following instructional materials:

$$P = \frac{\sum x}{\sum x_i} \text{ x } 100\%$$

$$P = \frac{67}{75} \text{ x } 100\%$$

$$= 90\ \%$$

Based on the results noted above, the percentage obtained by 90% at a valid qualification so that teaching materials do not need to be revised. The statement shows the natural science teaching materials fit for use in accordance with expert validation material.

2. Analysis Data Validation Expert Media Product Instructional Materials

Based on conversion scale specified in the product assessment questionnaire, as follows:

1. Score 1 for very not agree
2. Skor 2 for do not agree
3. Skor 3 for agree
4. Skor 4 for very agree

Following are the results of the validation data exposure media experts based on table 4.5 are as follows:

1. The media cover is suitable with the content of the material.
2. The type of fonts used are in accordance with the students of 4thgrade.

3. Font size use are in accordance with the students of 4thgrade.
4. Picture accordance with the material in the book is very well.
5. Images used to attract students.
6. Layout drawings in books attract.
7. Picture on a book close to the student life.
8. Dimensions image on the right book.
9. Colors in the book is very consistent.
10. Layout on a very interesting book.

Based on questionnaire responses completed by a media product design textbook, calculate the percentage of the level of validity of the following textbooks:

$$P = \frac{\sum x}{\sum x_i} \text{ x } 100\%$$

$$P = \frac{43}{50} \text{ x } 100\%$$

$$= 86\%$$

Based on the results noted above, the percentage of 86% is obtained which is valid so beraa on qualifying teaching materials do not need to be revised. The statement shows bahwasannya instructional materials science materials structure and function of plant parts constructivism based learning using the outdoor model fit for use with instructional media expert validation

3. Analysis Data Validation Expert Learning 4th Grade Natural Science Teacher

Based on the conversion scale specified in the product assessment questionnaire, are as follows:

1. Score 1 for no obvious, inappropriate, irrelevant, not systematic.
2. Scores 2 to less obvious, less appropriate, less relevant, less systematic.
3. Scores 3 for quite obvious, quite appropriate, relvan enough, quite systematic.
4. Scores 4 for a very clear, very appropriate, very relevant, very systematic.

Here are the results of the validation of data exposure to media expert on science teaching materials are as follows:

1. The introduction more detail.
2. At the end of the activity instance on activities included student worksheet 2.1

Data from the questionnaire responses were filled out by Mr. Ustanto Widarko, S.Pd As learning experts 4th grade teacher at SDN Turen 02, can be calculated using the percentage of Tertiary validity of teaching materials as follows:

$$P = \frac{\sum x}{\sum x_i} \text{ x } 100\%$$

$$P = \frac{51}{52} \text{ x } 100\%$$

$$= 98\%$$

Based on the results noted above, the percentage of 98% is obtained which is valid so beraa on qualifying teaching materials do not need to be revised. The statement shows bahwasannya instructional materials science materials structure and function of plant parts by using a model-based constructivist learning outdoor fit for use with instructional media expert validation.

4. Analysis Data Validation Test Product of Book Material

Based on Table 4.10, 4:11, 4:12, questionnaire responses were filled out by the test subjects are subjected throughout the fourth grade students of SDN Turen 02 Malang, which is divided into 3 phases: 1) individual trials, 2) small group trials, 3) test try field. The field trial assessment on each component as the data that has been analyzed quantitatively in Table 4.12 the following field trial data:

a. Subjects of Natural Science is to facilitate students in learning, assessment of the statement obtained by the percentage of 100%.
b. Natural Sciences Teaching materials can encourage students in learning, assessment of the statement obtained by the percentage of 100%.
c. This teaching material easier for students to understand the Natural Sciences assessment of the statement obtained by the percentage of 100%.
d. Problems in the Natural Sciences learning materials relatively easy assessment of the statement obtained by the percentage of 100%.

e. The font and font size contained in the instructional materials Natural Sciences is easy to read, the statement obtained from the assessment by the percentage of 100%.
f. During the course of this book, the student does not meet the difficult words, such statemant obtained from assessment by the percentage of 92%.
g. Instructions contained in the Natural Sciences teaching materials is very easy to understand, from the statement obtained by the assessment percentage 100%.
h. The language used in teaching materials can be understood, the statement obtained from the assessment by the percentage of 100%.
i. Exercises, in accordance with the discussion, like a statement obtained from the assessment percentage of 100%.
j. During the use of teaching materials, students do not need help from others such as friends, teachers, or parents to learn, from the statement obtained by assessment with the percentage of 80.3%.

Questionnaire responses were filled out by students of SDN Turen 02 Malang, amounting to 28 students, can be calculated using the percentage of the overall validity of the following instructional materials:

$$P = \frac{\sum x}{\sum x_i} \text{ x } 100\%$$

$$P = \frac{43}{50} \text{ x } 100\%$$

$$= 86\%$$

Based on the results of the above calculation, the percentage of 86% is obtained which is valid on qualifying so that teaching materials do not need to be revised. The statement indicates that the teaching materials fit for use in the learning process.

5. Data Analysis Results Pre-Test and Post-Test

Based on the data table 4:13 d ie the pre-test and post-test to the fourth grade students of SDN Turen02 malang shows that the average pre-test score was 66.42 and the average value of the post-test, indicating that there is an understanding that significantly as 85.7. Simultaneously amplified from t-test analysis showed that t_{count} = 4,641 bigger than t_{ablel} = 1,071. In conclusion then Ho is rejected and Ha accepted, so there are significant differences between the results before and after the use of comprehension instructional materials science materials structure and function of plant parts with the model-based outdoor learning constructivism. It could be argued that the instructional materials science is able to effectively improve the understanding of the science lessons for 4^{th} grade students

B. Revised Product Development Instructional Materials

1. Revised Product Development Matter Expert

Based on comments and suggestions from experts validator in Table 4.3, it can be seen in the following explanation:

a. Fixing a concept map with the correct sentences and explanations.

b. Fixing image with customized premises mindset childhood SD / MI and also gives an explanation of the image.

c. The depth of material tailored to the students' level of thinking.

d. Researching back posts in the teaching materials because there are some wrong

2. Revised Product Development by Learning Media Expert

Based on comments and suggestions from the media expert validator in Table 4.6, it can be seen in the following explanation:

a. Replacement contents preface with words more communicative for students.

b. Fix the cover of a cover by selecting the appropriate picture.

c. Using a full sheet with part 1 student activity sheet.

d. Replacement of the image in the material using a private image.

e. Color matching of learning objectives.

f. Replacement back cover with more varied

Image 5.1 Before and After the Revised

C. Analysis of Effectiveness, Efficiency, and the attractiveness of the Instructional Materials

Essentially learning is membelajarkan students to use educational principles and theories of learning which is a determinant for the success of an educational.

The steps taken by teachers teaching science in seeing the level of effectiveness, keefensiensi, exciting learning activities ie by dividing into three kinds, namely the initial activities, initi activities, and activities that teachers do penutup.tiga stages of implementing the learning process, so it can be done with systematic. The following description of the activities undertaken.

Initial activity of a task provides teachers, students focus on the material being taught, to motivate students' prior knowledge and explore either by way of question and answer, giving examples or stories that provide information related to the material to be studied.

Core activities, an activity describes the material as a whole. Core activities must go through several steps in order delivered sapat learning objectives thoroughly. Its phases divided into three namely exploration, elaboration, and confirmation. These stages are arranged in such a way that students can study objectives and indicators.

The final activity, is the ultimate learning activities. Closing a lesson not just end the lesson with a greeting, but here is the emphasis/ reinforcement of what has been obtained by students during the lesson,

the teacher draws conclusions on what they have learned. In closing activities are also conducted assessment and reflection on the learning that has been done. In addition to learning the teacher cover also provide a stimulus associated with the material that was submitted jointly concluded that the learning and remembering material that has been taught and reflect on their lessons.

CHAPTER VI

CONSCLUSION AND SUGGESTION

This chapter will explain the two main ideas of the research, namely (a) the conclusion of the results of development, (b) suggestions related to the development of teaching materials.

A. Conclusion

Based on the results pengembanagn development process and the results of recent tests on materials for science teaching 4^{th} grade at SDN Turen 02 the conclusion can be presented as follows:

1. The development of teaching textbooks such as books students produce teaching science material structure and function of plant parts with the model-based outdoor learning constructivism. Based on the evaluation of the product development of teaching materials have fulfilled the component as a textbook that meets the eligibility component is used as a guide or reference in the study include, validity, effectiveness and motivate students to learn the spirit
2. Trial results constructivism-based teaching materials development with outdoor learning models have a high degree of validity. Based on the results tanggpan criticism and suggestions from experts as well as evaluating the validator teachers of fourth grade students of SDN Turen 02

Malang as teaching materials, the following test resultsbased on constructivism method and outdoor learning models. The value of experts follow :

a. Responses acquire material expert assessment of the validity of the percentage reaches 90%
b. Response assessment of media experts acquire validity percentage reaches 95%.
c. Response assessment of learning science subject teachers acquire validity ersentase reached 92%.
d. Response assessment of the validity of field tests earn a percentage reaches 92%.

3. Constructivism methods and outdoor learning models, effect on improving student learning outcomes at the fourth grade science subject matter structure and function of plant parts in Elementary School Turen 02.

B. Suggestion

The suggestions put forward include suggestions for the purposes of product use constructivism method and outdoor learning models, dissemination product, and needs further development. In detail, the suggestions can be described as follows:

1. **Suggestions for Purposes Product Utilization**

To optimize utilization of fourth grade science textbook material structure and function of plant parts with suggested the following:

a. Instructional materials are prepared in conformity of the characteristics of students, so it is expected that students can use independently.

b. Constructivism-based teaching materials science with outdoor model learning material structure and function of the plant is not the only source of student learning, teachers should advise sisiwa to read other sources that are more relevant.

2. Suggestions for Dissemination Products

Development of constructivist-based teaching materials with outdoor learning models do not perform deseminasi stages (spread) roduk. However, if desired for some deseminasi process that need to be considered, namely:

a. 4^{th} grade science material structure and function of plant with constructivism method and outdoor learning models should be used in stages. First, fourth grade science textbook is used for individual study and subsequently used in the class as a whole.

b. The teaching materials are prepared based on the characteristics of students of Elementary School Turen 02. When you want reproduced, should be revised in accordance with the characteristics of other users

3. Suggestions for Continued Development

Based on the current record of trials that have been conducted, it is for advanced developers and to optimize the utilization of instructional materials, provide the following suggestions:

a. Product development has been made small revisions in accordance with the advice validator and students as users. However, to further improve the quality of teaching materials should further revised.
b. The teaching material was limited to the material structure and function of plant parts by karen it, need to be developed for other materials in science.

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Lampiran I

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CONSULTATION PROOF

Name : Latifatus Sholikha
ID Number : 10140048
Faculty/Department : Tarbiyah and Teaching Science/Islamic Elementary School Teacher Education
Advisor : Mokhammad Yahya, M.A.,Ph.D
Thesis Title : **Developing Science Textbook Based on Constructivism Method and Outdoor Learning Model on The Topic of Structure and Function of Plants to Improve Fourth Grade Students Achievement At Elementary School Turen 02 Malang**

No	Date	Consultation	Signature
1	September, 16th 2013	Proposal	
2	October, 13th 2013	Instruments	
3	April, 10th 2014	Chapter 1, 2 and 3	
4	April, 17th 2014	Chapter 4	
5	May, 13th 2014	Chapter 5	
6	May, 3rd 2014	Chapter 6	
7	June, 10th 2014	ACC ALL	

Malang, 1 Juli 2014
Approved by,
Dean of Tarbiyah and Teaching Science Faculty

Dr. H.Nur Ali,M.Pd
NIP. 196504031998031002

Lampiran II

KEMENTERIAN AGAMA
UNIVERSITAS ISLAM NEGERI MAULANA MALIK IBRAHIM MALANG
FAKULTAS ILMU TARBIYAH DAN KEGURUAN
Jalan Gajayana 50, Telepon (0341) 552398 Faximile (0341) 552398 Malang
http://tarbiyah.uin-malang.ac.id email : psg_uinmalang@ymail.com

Nomor : Un.3.1/TL.00.1/1443/2013 19 Juli 2013
Lampiran : 1 (satu) berkas proposal skripsi
Perihal : **Penelitian**

Kepada :
Yth. Kepala SDN 02 Turen
di
Malang

Assalamu'alaikum Wr. Wb.

Kami mengharap dengan hormat agar mahasiswa di bawah ini:

Nama	:	Latifatus Sholikha
NIM	:	10140048
Jurusan	:	PGMI
Semester	:	Genap, 2012/2013
Judul Skripsi	:	**Pengembangan Paket IPA Berbasis Kontruktivisme Untuk Meningkatkan Prestasi dan Pemahaman Siswa Kelas IV Pada Materi Struktur dan Fungsi Bagian Tumbuhan di SDN 02 Turen**

dalam rangka menyelesaikan tugas akhir/menyusun skripsi yang bersangkutan mohon diberikan izin/kesempatan untuk mengadakan penelitian di lembaga/instansi yang menjadi wewenang Bapak/Ibu.

Demikian atas perkenan dan kerjasama Bapak/Ibu disampaikan terima kasih.

Wassalamu'alaikum Wr. Wb.

a.n. Dekan,
Dr. H. Nur Ali, M.Pd
NIP. 19650403 199803 1 002

Tembusan :
1. Yth. Ketua Jurusan PGMI
2. Arsip

Lampiran III

PEMERINTAH KABUPATEN MALANG
DINAS PENDIDIKAN
UPTD TK, SD DAN PLS KECAMATAN TUREN
SEKOLAH DASAR NEGERI TUREN – 02
JL. A. YANI NO. 63 A KEL.TUREN NSS.101051817002 NPSN.20517709 TELP. 0341 – 823586 KODE POS 65175

SURAT KETERANGAN

Nomor : 670/066/421.102.416.02/2014

Yang bertanda tangan di bawah ini Kepala Sekolah Dasar Negeri Turen – 02 Kecamatan Turen Dinas Pendidikan Kabupaten Malang, menerangkan bahwa :

Nama	:	**LATIFATUS SHOLIKHA**
NIM	:	10140048
Jurusan/ Program Studi	:	Pendidikan Guru Madrasah Ibtidaiyah
Fakultas	:	F I T K
Semester	:	8 (delapan)

Mahasiswa tersebut di atas pada tanggal 26 Mei sampai dengan 30 Mei 2014 telah melaksanakan kegiatan penelitian untuk persyaratan skripsi pada siswa dan guru Mata Pelajaran Ilmu Pengetahuan Alam (IPA) kelas IV di SD Negeri Turen – 02 Kecamatan Turen Dinas Pendidikan Kabupaten Malang.

Demikian surat keterangan ini dibuat dengan benar untuk dapat dipergunakan sebagaimana mestinya.

Turen, 10 Juni 2014
Kepala Sekolah,

PEMERINTAH KABUPATEN MALANG
SDN TUREN 02
KECAMATAN TUREN
DINAS PENDIDIKAN

BAMBANG SUDJATMIKO, S.Pd
NIP. 19550729 197703 1 002

Lampiran IV

Draf Identitas Subyek Validator

No.	Nama	Subyek	Evaluator
1.	Dewi Anggraeni, M.Sc	Dosen Pendidikan Guru Madrasah Ibtidaiyah UIN Malang	Ahli Isi Bahan Ajar
2.	Ahmad Abtokhi, M.Pd	Dosen Fisika UIN Malang	Ahli Desain Bahan Ajar
3.	Ustanto Widarko, S.Pd	Guru Mata Pelajaran Ilmu Pengetahuan Alam Kelas IV di SDN 02 Turen	Ahli Pembelajaran IPA

Draf Identitas Subyek Uji Coba Lapangan

No.	Nama	Jabatan
1.	Anton Hadi Saputro	Siswa kelas IV di SDN Turen 02
2.	Fitra Wahyu Amalia	Siswa kelas IV di SDN Turen 02
3.	Luky Ayu Dinata	Siswa kelas IV di SDN Turen 02
4.	Trio Ardito	Siswa kelas IV di SDN Turen 02
5.	Firmansyah Saputra	Siswa kelas IV di SDN Turen 02
6.	Ardian Septiawan	Siswa kelas IV di SDN Turen 02
7.	Fani Yusafa	Siswa kelas IV di SDN Turen 02
8.	Hifni Ardiansyah	Siswa kelas IV di SDN Turen 02
9.	M. Feri Ardiansyah	Siswa kelas IV di SDN Turen 02
10.	Hana Nur Azizah	Siswa kelas IV di SDN Turen 02
11.	M. Bagus Saputra	Siswa kelas IV di SDN Turen 02
12.	Yuli Ismiawati	Siswa kelas IV di SDN Turen 02
13.	Anita Nuryana	Siswa kelas IV di SDN Turen 02
14.	Aulia Shitiantins	Siswa kelas IV di SDN Turen 02
15.	Alfin Ramadhani P	Siswa kelas IV di SDN Turen 02
16.	Dina Ebi Pratiwi	Siswa kelas IV di SDN Turen 02
17.	Gween Rahma Sella	Siswa kelas IV di SDN Turen 02
18.	Ilyas Maulana Hidayat	Siswa kelas IV di SDN Turen 02
19.	Mir’atul Ulya	Siswa kelas IV di SDN Turen 02

20.	Popy Dwi Wulandari	Siswa kelas IV di SDN Turen 02
21.	Riza Nur Aini	Siswa kelas IV di SDN Turen 02
22.	Rmadan Novan H	Siswa kelas IV di SDN Turen 02
23.	Sabrina Anggelika	Siswa kelas IV di SDN Turen 02
24.	Yolanda Putri Aulia	Siswa kelas IV di SDN Turen 02
25.	Akmal Sabitul M	Siswa kelas IV di SDN Turen 02
26.	Bagas Pratama	Siswa kelas IV di SDN Turen 02
27.	Dela Annisa	Siswa kelas IV di SDN Turen 02
28.	Elvara Adelia Febriana	Siswa kelas IV di SDN Turen 02

Lampiran V

ANGKET PENILAIAN AHLI ISI UJI COBA

PENGEMBANGAN BUKU PAKET

Kepada Yth. Dewi Anggraeni, M. Sc.

Ahli Isi Buku Ajar Sains untuk SD/MI

di Universitas Islam Negeri Maulana Malik Ibrahim

Malang

Assalamualaikum Wr. Wb

Dengan hormat,

Dalam rangka penulisan skripsi untuk memperoleh gelar sarjana Pendidikan di Prodi Pendidikan Guru Madrasah Ibtida'iyah Universitas Islam Negeri Maulana Malik Ibrahim Malang, berkaitan dengan pelaksanaan pengembangan bahan ajr Ilmu Pengetahuan Alam materi "Struktur dan Fungsi Bagian Tumbuhan", dengan berbasis *konstruktivisme* dengan menggunakan model *outdoor learning* di kelas IV SDN Turen 02 Kabupaten Malang. Bahan ajar ini dikembangkan dengan mengacu pada KTSP 2006.

Berkaitan dengan penelitian tersebut, saya bermaksud mengadakan uji coba produk bahan ajar yang sudah saya kembangkan. Hal ini bertujuan untuk mengetahui kelebihan dan kekurangan produk sehingga dapat dilakukan perbaikan sebelum digunakan dalam pembelajaran di kelas. Oleh karena itu, saya mohon kesediaan Bapak/Ibu untuk mengisi angket berikut ini. Atas bantuan Bapak/ Ibu, saya sampaikan terima kasih.

Malang,

Hormat kami,

A. Identitas Ahli

Nama Lengkap :
Jabatan :
Instansi :
Pangkat/golongan :
Pendidikan Terakhir :
Bidang Keahlian :
Masa Kerja dalam Bidang tersebut:

B. Petunjuk Pengisian Angket

Sebelum mengisi angket silakan Bapak/Ibu membaca petunjuk pengisian berikut ini.

1. cermatilah secara keseluruhan produk bahan ajar yang dikembangkan, kemudian isilah lembar penilaian dengan memberikan tanda (X) pada angka 1,2,3,4 sesuai dengan penilaian Bapak Ibu.
2. Pedoman penilaian
    1. Sangat tidak tepat, sangat tidak sesuai, sangat tidak jelas, sangat tidak menarik, sangat tidak mudah.
    2. Kurang tepat, kurang sesuai, kurang jelas, kurang menarik, kurang mudah.
    3. Cukup tepat, cukup sesuai, cukup jelas, cukup menarik, cukup mudah.
    4. Tepat, sesuai, jelas, menarik, mudah.
    5. Sangat tepat, sangat sesuai, sangat jelas, sangat menarik, sangat mudah.
3. Selain memberikan skor, mohon Bapak/Ibu juga menuliskan saran-saran pada lembar yang telah disediakan

C. Berilah tanda silang (X) pada alternatif jawaban yang dianggap paling sesuai.

1. Bagaimana dengan tingkat relevansi buku ajar dengan kurikulum yang berlaku?

1	2	3	4	5
Sangat kurang relevan	Kurang relevan	Cukup relevan	Relevan	Sangat relevan

2. Bagaimana ketepatan penulisan judul buku dan judul bab pada buku ajar?

1	2	3	4	5
Sangat kurang tepat	Kurang tepat	Cukup tepat	Tepat	Sangat tepat

3. Bagaimana dengan bahasa yang digunakan pada buku ajar?

1	2	3	4	5
Sangat kurang komunikatif	Kurang komunikatif	Cukup komunikatif	Komunikatif	Sangat komunikatif

4. Bagaimana kemudahan bahasa untuk dipahami dalam buku ajar?

1	2	3	4	5
Sangat kurang mudah	Kurang mudah	Cukup mudah	Mudah	Sangat mudah

5. Apakah peta konsep dapat memberi kejalasan materi yang akan dibahas?

1	2	3	4	5
Sangat kurang jelas	Kurang jelas	Cukup jelas	Jelas	Sangat jelas

6. Bagaimana ketepatan tujuan pembelajaran pada awal bab?

1	2	3	4	5
Sangat kurang tepat	Kurang tepat	Cukup tepat	Tepat	Sangat tepat

7. Bagaimana kesesuaian percobaan-percobaan yang disajikan untuk memperjelas konsep?

1	2	3	4	5
Sangat kurang sesuai	Kurang sesuai	Cukup sesuai	Sesuai	Sangat sesuai

8. Bagaimana dengan penambahan percobaan pada buku ajar?

1	2	3	4	5
Sangat kurang tepat	Kurang tepat	Cukup tepat	Tepat	Sangat tepat

9. Bagaimana penulisan alat bahan dan langkah – langkah percobaan pada setiap percobaan yang ada pada buku ajar?

1	2	3	4	5
Sangat kurang baik	Kurang baik	Cukup baik	Baik	Sangat baik

10. Bagaimana dengan ketepatan pemberian pertanyaan dan kesimpulan pada setiap akhir percobaan?

1	2	3	4	5
Sangat kurang tepat	Kurang tepat	Cukup tepat	Tepat	Sangat tepat

11. Apakah komponen isi buku sudah memadai sebagai buku ajar?

1	2	3	4	5
Sangat kurang memadai	Kurang memadai	Cukup memadai	Memadai	Sangat memadai

12. Bagaimana keluasan dan kedalaman isi bahan ajar?

1	2	3	4	5
Sangat kurang luas	Kurang luas	Cukup luas	Luas	Sangat luas

13. Bagaimana keruntutan penyajian materi?

1	2	3	4	5
Sangat kurang runtut	Kurang runtut	Cukup runtut	Runtut	Sangat runtut

14. Bagaimana konsistensi format bahan ajar?

1	2	3	4	5
Sangat kurang konsisten	Kurang konsisten	Cukup konsisten	Konsisten	Sangat konsisten

15. Bagaimana ketercernaan uraian materi?

1	2	3	4	5
Sangat kurang sesuai	Kurang sesuai	Cukup sesuai	Sesuai	Sangat sesuai

D. Mohon berikan komentar dan saran tentang isi buku ajar ini!

No.	Halaman/bagian	Komentar terhadap isi buku	Saran

E. Mohon berikan komentar dan saran secara keseluruhan tentang isi buku ajar ini!

.....

.....

.....

.....

Malang, Desember 2013

Penguji

(.....)

NIP.

Lampiran VI

ANGKET PENILAIAN AHLI DESAIN UJI COBA

PENGEMBANGAN BUKU PAKET

Kepada Yth. Ahmad Abtokhi, M. Pd

Ahli Desain Buku Ajar Sains untuk SD/MI

di Universitas Islam Negeri Maulana Malik Ibrahim

Malang

Assalamualaikum Wr. Wb

Dengan hormat,

Dalam rangka penulisan skripsi untuk memperoleh gelar sarjana Pendidikan di Prodi Pendidikan Guru Madrasah Ibtida'iyah Universitas Islam Negeri Maulana Malik Ibrahim Malang, saya melakukan penelitian yang berjudul Pengembangan Bahan Ajar IPA Materi "Struktur dan Fungsi Bagian Tumbuhan" Berbasis *konstruktivisme* dengan menggunaka model *outdoor learning* pada Siswa Kelas IV SDN Turen 02 di Kabupaten Malang. Bahan ajar ini dikembangkan dengan mengacu pada KTSP 2006.

Berkaitan dengan penelitian tersebut, saya bermaksud mengadakan uji coba produk bahan ajar yang sudah saya kembangkan. Hal ini bertujuan untuk mengetahui kelebihan dan kekurangan produk sehingga dapat dilakukan perbaikan sebelum digunakan dalam pembelajaran di kelas. Oleh karena itu, saya mohon kesediaan Bapak/Ibu untuk mengisi angket berikut ini. Atas bantuan Bapak/ Ibu, saya sampaikan terima kasih.

Malang, Desember 2013

Hormat kami,

A. Identitas Ahli

Nama Lengkap :
Jabatan :
Instansi :
Pangkat/golongan :
Pendidikan Terakhir :
Bidang Keahlian :
Masa Kerja dalam Bidang tersebut:

B. Petunjuk Pengisian Angket

Sebelum mengisi angket silakan Bapak/Ibu membaca petunjuk pengisian berikut ini.

1. Cermatilah secara keseluruhan produk bahan ajar yang dikembangkan, kemudian isilah lembar penilaian dengan memberikan tanda (X) pada angka 1,2,3,4 sesuai dengan penilaian Bapak Ibu.
2. Pedoman penilaian
   a. Sangat tidak tepat, sangat tidak sesuai, sangat tidak jelas, sangat tidak menarik, sangat tidak mudah.
   b. Kurang tepat, kurang sesuai, kurang jelas, kurang menarik, kurang mudah.
   c. Cukup tepat, cukup sesuai, cukup jelas, cukup menarik, cukup mudah.
   d. Tepat, sesuai, jelas, menarik, mudah.
   e. Sangat tepat, sangat sesuai, sangat jelas, sangat menarik, sangat mudah.
3. Selain memberikan skor, mohon Bapak/Ibu juga menuliskan saran-saran pada lembar yang telah disediakan.

C. Berilah tanda silang (X) pada alternatif jawaban yang dianggap paling sesuai.

1. Bagaimana kemenarikan pengemasan desain cover pada buku ajar?

1	2	3	4	5
Sangat kurang menarik	Kurang menarik	Cukup menarik	Menarik	Sangat menarik

2. Bagaimana kesesuaian gambar pada cover pada buku ajar?

1	2	3	4	5
Sangat kurang sesuai	Kurang sesuai	Cukup sesuai	Sesuai	Sangat sesuai

3. Bagaimana dengan kesesuaian judul bab dan pemilihan gambar pembuka bab dalam buku ajar?

1	2	3	4	5
Sangat kurang sesuai	Kurang sesuai	Cukup sesuai	Sesuai	Sangat sesuai

4. Bagaimana dengan kemenarikan peta konsep pada pada buku ajar?

1	2	3	4	5
Sangat kurang menarik	Kurang menarik	Cukup menarik	Menarik	Sangat menarik

5. Bagaimana dengan kesesuaian pemakaian jenis huruf yang digunakan pada cover pada buku ajar?

1	2	3	4	5
Sangat kurang sesuai	Kurang sesuai	Cukup sesuai	Sesuai	Sangat sesuai

6. Bagaimana dengan ketepatan layout pengetikannya?

1	2	3	4	5
Sangat kurang tepat	Kurang tepat	Cukup tepat	Tepat	Sangat tepat

7. Bagaimana dengan konsistensi penggunaan spasi, judul, dan pengetikan materi?

1	2	3	4	5
Sangat kurang konsisten	Kurang konsisten	Cukup konsisten	Konsisten	Sangat konsisten

8. Bagaimana ketepatan penempatan gambar pada setiap sub bab pada buku ajar?

1	2	3	4	5
Sangat kurang tepat	Kurang tepat	Cukup tepat	Tepat	Sangat tepat

9. Bagaimana kesesuaian penggunaan variasi jenis, ukuran dan bentuk huruf untuk judul bab?

1	2	3	4	5
Sangat kurang sesuai	Kurang sesuai	Cukup sesuai	Sesuai	Sangat sesuai

10. Bagaimana kesesuaian penggunaan variasi jenis, ukuran dan bentuk huruf untuk judul setiap percobaan?

1	2	3	4	5
Sangat kurang sesuai	Kurang sesuai	Cukup sesuai	Sesuai	Sangat sesuai

D. Mohon berikan komentar dan saran tentang isi buku ajar ini!

No.	Halaman/bagian	Komentar terhadap isi buku	Saran

E. Mohon berikan komentar dan saran secara keseluruhan tentang isi buku ajar ini!

.....

.....

.....

Malang, Desember 2013

Penguji

(.....)

NIP.....

Lampiran VII

INSTRUMEN VALIDASI BUKU AJAR OLEH AHLI PEMBELAJARAN GURU BIDANG STUDI ILMU PENGETAHUAN ALAM (IPA) KELAS IV

A. Pengantar

Berkaitan dengan pelaksanaan pengembangan buku ajar Ilmu Pengetahuan Alam (IPA) kelas IV tentang materi struktur dan fungsi bagian tumbuhan dengan menggunakan pembelajaran berbasis ***kontruktivisme*** dengan menggunakan metode ***outdoor learning*** di SD, maka peneliti bermaksud mengadakan validasi buku ajar yang telah diproduksi sebagai salah satu bahan pembelajaran. Untuk maksud di atas, peneliti mohon kesediaan Bapak/Ibu agar mengisi angket di bawah ini sebagai pelaksanaan pembelajaran ilmu pengetahuan alam (IPA). Tujuan dari pengisian angket adalah mengetahui kesesuaian pemanfaatan buku ajar ini sebagaimana yang telah dirancang berdasarkan disiplin ilmu IPA. Hasil dari pengukuran melalui angket akan digunakan untuk penyempurnaan buku ajar agar dapat dimanfaatkan dalam pembelajaran. Sebelumnya saya sampaikan terima kasih atas kesediaan Bapak/Ibu sebagai ahli pembelajaran IPA/SAINS.

Nama : .....
NIP : .....
Instansi : .....
Pendidikan : .....
Alamat : .....

B. Petunjuk Pengisian Angket

1. Sebelum mengisi angket mohon terlebih dahulu Bapak/Ibu membaca atau mempelajari bahan ajar yang dikemabangkan.
2. Berilah tanda silang (x) pada salah satu huruf a, b, c, atau d pada jawaban yang sesuai dengan penilaian yang adik anggap paling tepat.
3. Kecermatan dalam penilaian ini sangat diharapkan.

C. Pertanyaan-pertanyaan Angket

1. Bagaimanakah rumusan topik pengembangan buku ajar IPA ini?
   a. Sangat jelas, spesifik, dan operasional
   b. Cukup jelas, spesifik, dan operasional
   c. Kurang jelas, spesifik, dan operasional
   d. Tidak jelas, spesifik, dan operasional
2. Bagaimanakah kesesuaian materi yang disajikan pada pengembangan buku ajar IPA ini?
   a. Sangat sesuai
   b. Cukup sesuai
   c. Kurang sesuai
   d. Tidak sesuai
3. Apakah rumusan indikator dalam buku guru yang disajikan sesuai dengan rumusan Kompetensi Dasar yang telah ditetapkan dalam KTSP 2006?
   a. Sangat sesuai
   b. Cukup sesuai
   c. Kurang sesuai
   d. Tidak sesuai
4. Bagaimana relevansi Standar Kompetensi dengan indikator pada pengembangan buku ajar IPA ini?
   a. Sangat relevan
   b. Cukup relevan
   c. Kurang relevan
   d. Tidak relevan
5. Apakah isi pembelajaran dalam buku ajar sesuai dengan KTSP 2006?
   a. Sangat sesuai
   b. Cukup sesuai
   c. Kurang sesuai
   d. Tidak sesuai
6. Bagaimana sistematik uraian isi pembelajaran dalam buku ajar IPA ini?
   a. Sangat sistematis
   b. Cukup sistematis
   c. Kurang sistematis
   d. Tidak sistematis
7. Bagaimana ruang lingkup materi yang disajikan dalam buku ajar IPA ini?
   a. Sangat sesuai dengan tema

b. Cukup
c. Kurang
d. Tidak

8. Apakah inti pembelajaran yang dirancang berfokus pada siswa?
   a. Sangat fokus
   b. Cukup
   c. Kurang
   d. Tidak
9. Apakah inti pembelajaran yang dirancang memberikan kesempatan kepada siswa untuk bekerjasama dengan teman atau berinteraksi dengan lingkungan?
   a. Sangat memberikan kesempatan dengan teman dan lingkungan
   b. Cukup
   c. Kurang
   d. Tidak
10. Apakah materi yang disajikan melalui buku ajar IPA ini dapat memberikan motivasi kepada siswa agar lebih giat belajar?
   a. Sangat memotivasi
   b. Cukup
   c. Kurang
   d. Tidak
11. Bagaimana tingkat kesukaran bahasa yang digunakan, apakah sesuai dengan tingkat pemahaman siswa?
   a. Sangat sesuai
   b. Cukup
   c. Kurang
   d. Tidak
12. Apakah instrumen evaluasi yang digunakan dapat mengukur kemampuan siswa?
   a. Dapat mengukur kemampuan siswa
   b. Cukup
   c. Kurang
   d. Tidak
13. Apakah rencana pembelajaran yang dibuat dalam buku guru mudah untuk diterapkan?
   a. Sangat mudah b. Tidak
   c. Cukup d. Kurang

D. Kritik dan Saran

Malang, Mei 2014

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NIP.

Terima Kasih

Lampiran VIII

Angket untuk Siswa

ANGKET TANGGAPAN/PENILAIAN UJI COBA LAPANGAN BAHAN AJAR IPA MATERI FOTOSINTESIS

Nama Lengkap :
Kelas :
Sekolah :
Absen :

Petunjuk Pengisian :

A. Berilah tanda silang (X) pada alternatif jawaban yang dianggap paling sesuai!

1. Bagaimana kemenarikan sampul pada buku ajar IPA Materi Struktur dan Fungsi Bagian Tumbuhan?

1	2	3	4	5
Sangat tidak menarik	Kurang menarik	Cukup menarik	Menarik	Sangat menarik

2. Apakah ukuran dan jenis huruf yang digunakan dalam bahan ajar mudah dibaca?

1	2	3	4	5
Sangat tidak mudah	Kurang mudah	Cukup mudah	Mudah	Sangat mudah

3. Bagaimana kejelasan tujuan pembelajaran?

1	2	3	4	5
Sangat tidak jelas	Kurang jelas	Cukup Jelas	Jelas	Sangat Jelas

4. Apakah contoh – contoh gambar pada setiap percobaan membantu anda memahami langkah-langkah percobaan?

1	2	3	4	5
Sangat tidak membantu	Kurang membantu	Cukup Membantu	Membantu	Sangat membantu

5. Bagaimana kejelasan langkah-langkah percobaan pada buku ajar IPA?

1	2	3	4	5
Sangat tidak jelas	Kurang jelas	Cukup jelas	jelas	Sangat jelas

6. Apakah dengan melakukan percobaan dapat membantu anda dalam meningkatkan pemahaman konsep materi Struktur dan Fungsi Bagian Tumbuhan?

1	2	3	4	5
Sangat tidak membantu	Kurang membantu	Cukup Membantu	Membantu	Sangat membantu

7. Apakah percobaan yang disajikan memberikan pengetahuan baru?

1	2	3	4	5
Sangat tidak menyajikan	Kurang menyajkan	Cukup menyajikan	Menyajikan	Sangat menyajikan

8. Apakah penulisan kesimpulan pada tiap akhir percobaan membantu anda memahami materi?

1	2	3	4	5
Sangat tidak membantu	Kurang membantu	Cukup Membantu	Membantu	Sangat membantu

9. Apakah buku ajar ini dapat dipahami uraian materinya dengan mudah?

1	2	3	4	5
Sangat tidak mudah	Kurang mudah	Cukup mudah	mudah	Sangat mudah

10. Apakah dengan buku ajar ini, anda termotivasi mengikuti pembelajaran IPA?

1	2	3	4	5
Sangat tidak termotivasi	Kurang termotivasi	Cukup termotivasi	Termotivasi	Sangat termotivasi

B. Berilah komentar dan saran lainnya berkenaan dengan bahan ajar!

_____

_____

_____

Lampiran IX

Soal Evaluasi Pre-Test Materi Struktur dan Fungsi Tumbuhan

UJI KOMPETENSI SISWA

Nama :	**No. Absen :**
Kelas :	**Nilai :**

A. Uji Kompetensi dan Pemahaman Konsep

I. Berilah tanda silang (X) pada huruf a, b, c, atau d dengan jawaban yang benar!

1. Bagian tumbuhan yang tumbuh di dalam tanah di sebut . . . .
   a. Akar
   b. Batang
   c. daun
   d. bunga

   (UASBN 2009/2010)

2. Berikut ini merupakan fungsi akar kecuali . . . .
   a. Menyerap air dan garam mineral
   b. Menunjang berdirinya tumbuhan
   c. Tempat penyimpanan cadangan makanan
   d. Tempat pembentukan makanan

3. Berdasarkan bentuknya, terdapat dua jenis akar yaitu akar . . . .
   a. Serabut dan gantung
   b. Serabut dan napas
   c. serabut dan tunggang
   d. gantung dan pelekat

4. Bagian tumbuhan yang berguna sebagai pengangkut atau alat transportasi tumbuhan untuk mengangkut zat hara dan air adalah . . . .
   a. Akar
   b. Daun
   c. batang
   d. bunga

   (UASBN 2009/2010)

5. Batang pohon jati di bawah ini merupakan merupakan jenis batang . . . .
   a. Berkayu
   b. Rumput
   c. basah
   d. kering

6. Contoh tumbuhan yang berdaun majemuk adalah . . . .
   a. Tebu dan jagung
   b. Sirih dan gadung
   c. pandan dan teki
   d. turi dan putri malu

7. Bunga yang tidak memiliki benang sari disebut . . . .
   a. Bunga sempurna
   b. Bunga jantan
   c. bunga betina
   d. bunga sepatu
8. Bentuk tulang daun pepaya pada gambar di bawah ini adalah . . . .

   a. melengkung
   b. Sejajar
   c. Menyirip
   d. Menjari
9. Tumbuhan yang memiliki bentuk susunan tulang daun melengkung adalah . . . .
   a. Daun sirih
   b. Daun mangga
   c. daun singkong
   d. daun jagung
10. Bentuk susuana tulang daun srih pada gambar di bawah adalh . . .

   a. Melengkung
   b. Sejajar
   c. Menyirip
   d. Menjari

II. Isilah titik-titk di bawh ini dengan benar!

1. Bagian tumbuhan yag berfungsi sebagai tempat berlangsungnya fotosintesis adalah . . . .
2. Batang pohon mahoni termasuk kedalam jenis batang . . . .
3. Alat kelamin jantan pada bunga sering disebut . . . . dan alat kelamin betina disebut . . . .
4. Daun pandan dan daun jagung memiliki susunan tulang daun yang sama-sama berbentuk . . . .
5. Tumbuhan yang menyimpan cadangan makanan di batang adalah . . . .

Lampiran X

Soal Evaluasi Post Test Materi Struktur dan Fungsi Tumbuhan

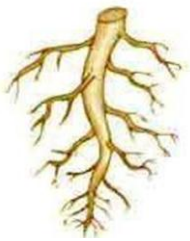
UJI KOMPETENSI SISWA

Nama :	**No. Absen :**
Kelas :	**Nilai :**

A. Uji Kompetensi dan Pemahaman Konsep

I. Berilah tanda silang (X) pada huruf a, b, c, atau d dengan jawaban yang benar!

1. Berdasarkan bentuknya, terdapat dua jenis akar yaitu akar . . . .
   a. Serabut dan gantung
   b. Serabut dan napas
   c. serabut dan tunggang
   d. gantung dan pelekat
2. Berikut ini merupkan fungsi akar, kecuali . . . .
   a. Menyerap air dan garam mineral
   b. Menunjang berdirinya tumbuhan
   c. Tempat penyimpanan cadangan makanan
   d. Tempat pembentukan makanan
3. Gambar di bawah ini merupakan jenis akar . . . .



   a. Serabut
   b. Gantung
   c. Tunggang
   d. napas

   (UASBN 2009/2010)
4. Bagian tumbuhan yang berfungsi sebagai pengangkut atau transportasi adalah . . . .
   a. Akar
   b. Batang
   c. daun
   d. bunga
5. Daun sirih dan daun gadung memiliki susuanan tulang daun yang berbentuk . . . .
   a. Majemuk
   b. Sejajar
   c. menjari
   d. melengkung
6. Contoh tumbuhan yang berdaun majemuk adalah . . . .
   a. Tebu dan jagung
   c. pandan dan teki

b. Sirih dan gadung d. turi dan putri malu

7. Bagian tumbuhan yang bertugas menyerap sinar matahari saat proses pembuatan makanan yaitu . . . .
   a. Klorofil c. akar
   b. Kambium d. ranting
8. Peristiwa jatuhnya serbuk sari ke atas kepala putik disebut . . . .
   a. Stomata c. klorofil
   b. Penyerbukan d. perkembangbiakan
9. Bunga yang tidak memiliki benanng sari disebut . . . .
   a. Bunga sempurna c. bunga betina
   b. Bunga jantan d. bunga sepatu
10. Tumbuhan di bawah ini yang memiliki jenis batang basah adalah . . . .
    a. Mahoni c. bayam
    b. Padi d. jati

II. Isilah titik-titk di bawh ini dengan benar!

1. Saat masih kuncup, bunga dibungkus oleh bagian bunga yang disebut . . . .
2. Daun pandan dan daun jagung memiliki susunan tulang daun yang sama-sama berbentuk . . . .
3. Alat kelamin jantan pada bunga sering disebut . . . . dan alat kelamin betina disebut . . . .
4. Sebutkan 4 bentuk susunan dari tulang daun . . . .
5. Bentuk tulang daun pepaya pada gambar di bawah ini adalah . . . .

Lampiran XI

RESEARCH DOCUMENTATION

Lampiran XII

DAFTAR RIWAYAT HIDUP

Nama : Latifatus Sholikha

TTL : Malang, 1 Juni 1992

Alamat : Jl. Kebon alas 10 Rt 10 Rw 20 Turen-Malang

No Telp : 085649512250

E-mail : latifatussholikha@gmail.com

Latar Belakang Pendidikan:

a. Pendidikan Formal

1. TK Mayor Damar Bokor-Turen 1997.
2. SDN Turen 02 Tahun 1998 s/d 2004.
3. MTsN Turen, Tahun 2004 s/d 2007.
4. SMA WIDYA DHARMA Turen, Tahun 2007 s/d 2010.
5. S1 Fakultas Ilmu Tarbiyah dan Keguruan UIN Maulana Malik Ibrahim Malang Tahun 2010 s/d sekarang.

b. Pendidikan Non Formal

1. Pondok Pesantren Al-Lathifiyah, Turen kabupaten Malang.
2. Ma'had Sunan Ampel Al-Aly (MSAA) UIN Maulana Malik Ibrahim Malang.

c. Pengalaman Organisasi

1. 1999-2004 Anggota Pramuka
2. 2004-2007 BDI (Badan Dakwah Islam)
3. 2007-2010 OSIS, Redaksi Majalah Vista, LKIR (lembaga karya ilmiah remaja).
4. 2010-sekarang UKM Seni Religius, HMI (Himpunan Mahasiswa Islam), FLP (Forum Ling kar Pena), PSM (Paduan Suara Mahasiswa).

d. Karya-Karya:

1. Antalogi Cerpen berjudul "Sang Pembohong" oleh Diva-Press. Maret -2011
2. Antalogi Cerpen berjudul "Matre" oleh Forum Lingkar Pena Cabang Uin Malang. April 2013.